COAL AGE

Vol. 7 NEW YORK, MAY 29, 1915 No. 22

Unintentional Distortion

WE have recalled many times the accompanying observation of Pascal's in following the testimony developed by the Federal Industrial Relations Commission and we have wondered what might be the effect of placing that remark on a wall conspicuously before all of the witnesses as they give testimony.

> I hold it to be a fact that if all persons knew what each said of the other there would not be four friends in the world.

This quotation is a bit of wisdom left by Pascal, who devoted several years of his life to the collecting of proverbs.

Any one can talk interestingly if questioned as to his opinion about someone else, but such testimony as a rule has little value beyond its power to entertain; and yet more than half of the commission's questions, at least so far as the mining industry is concerned, could be answered by pure gossip.

If we substitute thought for "said" in Pascal's remark, it would no longer hold water; who believes that the majority of Union men in Colorado or elsewhere look upon the operators of coal mines as being one-half as black as they are so willing to picture them?

It does not necessarily follow that such testimony is rehearsed beforehand "with malice aforethought" any more than it follows that ordinary gossip originates from evil intent. It just happens that the normal human mind has a way of being led far afield by the imagination if the imagination is given half a chance. The truth of this has been brought out time and again in public hearings held by boards of arbitration, and it is even used as an argument by most, if not all, the opponents of arbitration.

An employee that has been contented with his surroundings and conditions of employment is more than liable to give the most startling testimony, providing the audience seems to demand it and the questions suggest it. After the hearing is concluded, the man himself will probably not be able to give any satisfactory explanation for his action if questioned.

And yet of hearings and investigations there is apparently to be no end. We are all too apt to see only the abuse of a thing. The abuse is nothing against the proper use.

Out of the present world-wide turmoil let us hope there will come an era of moral fellowship for employer and employee, as well as an age of good-will on the part of great nations. Then benefactors will forget what they have given, and beneficiaries will remember what they have received. Laws will be created to reform the individual rather than to punish him.

Crime will be treated preventively rather than retributively.

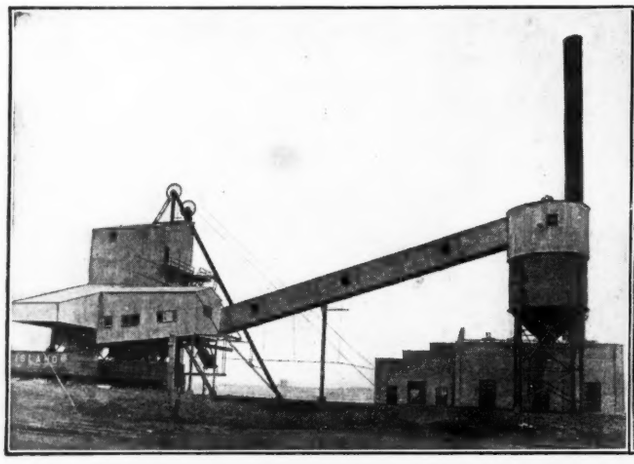
A Modern Coal Mine in Iowa

By Willis P. Thomas*

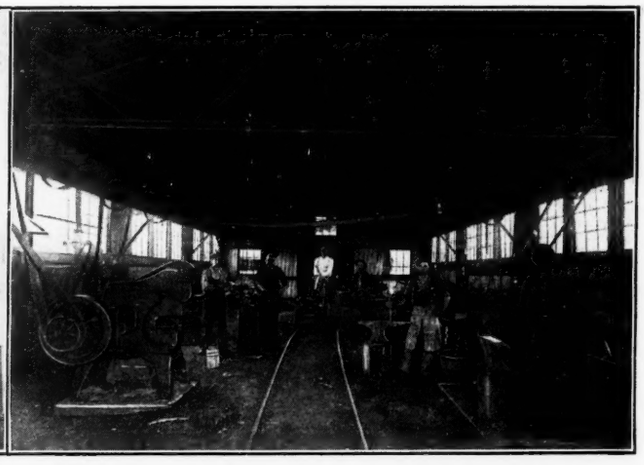
SYNOPSIS—Description of a comparatively new operation where advanced ideas in the matter of concrete and steel construction have been carried out. Electric hoisting and electric haulage are employed. The system of screening and picking the coal is quite efficient.

Situated 40 miles south of Des Moines, Iowa, on the Rock Island "Short Line" is the Electra mine of the Consolidated Indiana Coal Co. This company, which is owned by the Rock Island R.R. through stock ownership, has approximately 4500 acres of Iowa coal, the bulk of which lies in Marion County. Electra mine, which is one of the most modern plants in the Middle West, was located in the center of the company's holdings to serve as the central power plant for all future developments in the field. Power is also sold to nearby towns for lighting purposes and commercial use.

As the country is quite rough considerable heavy grading was required to construct the gravity yards, which have a capacity of 75 empty cars and 75 loads. Track scales were installed for the weighing of empty and loaded cars, accurate weights thus being secured.



Tipple and Storage Bin



Interior of Shop

The Mine Tipple

The tipple which spans three tracks is constructed of steel throughout, the headframe having a concrete covering to prevent corrosion from moisture and gases rising out of the shaft. In order to better control the dumping of the coal, the hoisting engineer is located in the tipple, standing directly in front of the dump. He is thus enabled to use a speed in dumping which will secure proper screening over the bars with a minimum breakage of the coal. After being dumped the coal passes over a 6x12-ft. bar screen. The bars in this screen have a 1⅜-in. spacing, the lump going into the weigh-pan.

This weigh-pan is provided with a two-way gate. Dumping one way, the coal passes to the shaker screen; dumping the other way, the coal passes over a chute suspended over the shaker to the lump-track direct. Mine-run coal can also be loaded over this chute by covering the bars with flat sheets. The shaker screen, which is connected by toggles with an electric motor, makes slack, egg and lump coal. The egg coal, which carries practically all of the dirt and impurities, is run over a picking table to insure a thoroughly clean preparation.

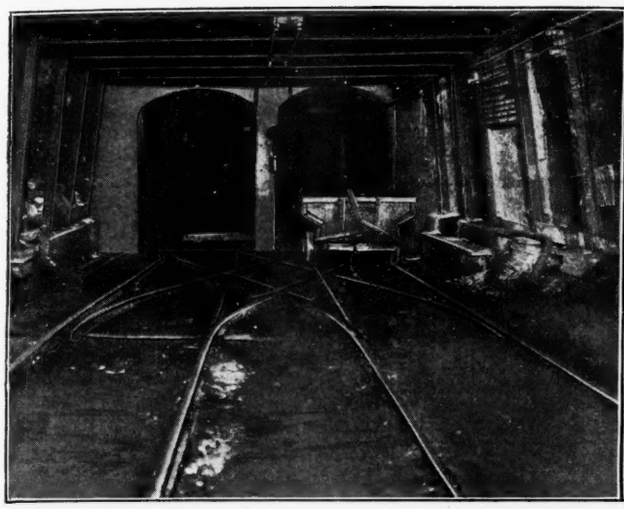
The tipple is so arranged that if necessary the egg coal can be loaded in box cars as well as the lump. If there should be a temporary shortage of cars the slack coal can be run into a 200-ton capacity storage bin which is located directly in front of the boiler plant. This bin is also used as storage for boiler coal, the slack being spouted direct to the stoker hopper. This location of the storage bin is economical as it serves a double purpose.

Boiler and Engine Rooms

The boiler and engine rooms are located a short distance from the tipple and adjacent to the mine tracks. The buildings are of brick-and-steel construction. The ends of the buildings are of corrugated iron so that they can be readily taken down whenever it is necessary to install additional equipment. The boiler room at present contains two Geary 300-hp. water-tube boilers equipped with Illinois chain-grate stokers, feed-water heater and feed pumps in duplicate. Draft is furnished by a steel stack 5 ft. in diameter and 135 ft. in height. The ashes from the stokers drop off at the rear end of the boilers into a small hopper and are blown out through an 8-in. pipe by steam into a ravine back of the boiler plant.

The engine-room equipment consists of a 660-kw. General Electric generator driven by a Curtis condensing steam turbine, a 100-kw. motor-generator set for haulage and mining machines and the hoisting engine, which is driven by a 350-hp. induction motor using 2300 volts. In the basement of this building are located the vacuum pump and condenser. One interesting feature of this boiler and engine-room installation is that one man operates it all, even to the disposal of the boiler-plant ashes. Hoisting is done through a concrete shaft, the concrete being cast around a steel framework. The design of this

*Mining engineer, Des Moines, Iowa.



VIEW AT SHAFT BOTTOM SHOWING STEEL TIMBERING

MOTOR AND TRIP ENTERING SHAFT BOTTOM

shaft was made by Carl Scholz, general manager of the company, and is something entirely new in concrete construction. The design gives great strength and large clearances for the passage of air while hoisting is taking place. The coal seam is reached in the shaft at a depth of 185 ft. The second opening to the underground workings is through a slope driven at an angle of 17 deg. Here steel timbering is used, and a concrete partition divides the slope into two compartments, one of which is used for an airway and the other as a manway. The second compartment is also used to handle supplies into the mine. With this arrangement it is possible to handle coal through the shaft the full 8 hours without interruption.

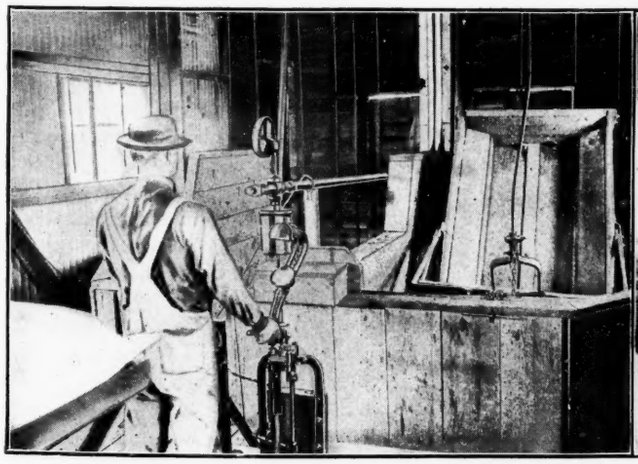
THE SHAFT BOTTOM

The shaft bottom is 16 ft. wide, double tracked and timbered with steel, the caging being done from one side on gravity tracks. The empties are elevated by two-car hauls to such a height that they run by gravity back to the main east and west haulage roads, where they are picked up by the motors. All of the main haulage as well as most of the gathering is done with electric motors. The seam is quite rolling, resulting in grades as high as 12 per cent. against the loads in some rooms. Where this is the case gathering motors with independent-driven crabs are used to bring the cars to the entries.

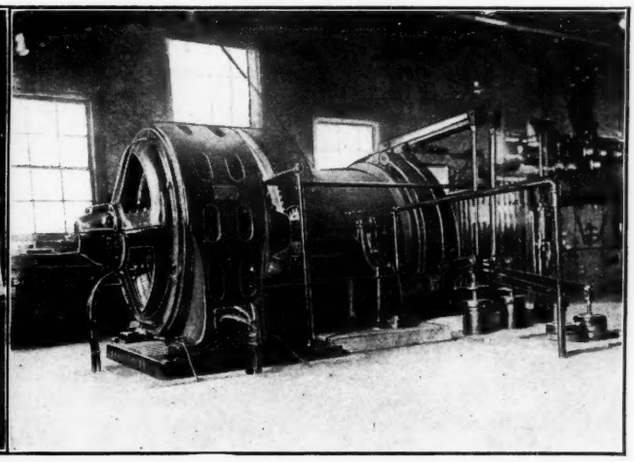
Quite a little steel timbering has been done, especially on permanent air-courses. Main haulage roads which have a 36-in. gage are laid with 25-lb. steel on 4x5-in. wooden ties. Room tracks are laid with 16-lb. steel placed on steel ties. These ties are found to be of great advantage in the low coal as they take up very little in height and are more economical than wooden ties because they may be used over and over. A telephone system connects the underground workings with the mine office, power house and shop as well as the tipple.

Pick and machine mining are both in use. Machine mining is done with shortwall machines which cut rooms with a double track and a 60-ft. face. It has been found that the roof stands as well under these conditions, if the timbering is done properly, as it formerly did in a 25-ft. room.

Miners' dwellings have been built about a half a mile from the plant, each house being of different design and painted a color different from the house adjoining. The effect is pleasing to the eye and gives each place an individuality of its own. Each house has a large lot with ample space for a garden in the rear. Water is supplied from a large reservoir to the whole townsite. The management's idea in building a superior class of houses is to attract a better class of men and to promote better living conditions. The plan seems to have been successful.



HOISTING ENGINEER AND CAR JUST FINISHED DUMPING



ELECTRIC HOIST OPERATED FROM THE MINE TIPPLE

The Air Factor in Dust Explosions

By John Verner*

SYNOPSIS—Objection to use of facts of limited application to establish a general rule. A brief outline of facts essential to explosive combustion. The Eskmeals tests taken for illustration. Effect of draft to produce and maintain explosive combustion. The counter-current theory defended. The condition of the air factor important. The Illinois investigations. Explosion in a drift mine. The Royalton explosion. Influence of temperature and barometer on explosive conditions in mines. The position of the cannon in a testing gallery important. The results and hasty conclusions in the Bruceton tests.

In the introductory remarks of *Bulletin* 83, issued by the Bureau of Mines and entitled "The Humidity of Mine Air," having special reference to coal mines in Illinois, the following statement appears:

> Experiments in the gas-and-dust gallery at the Pittsburgh testing station of the Bureau of Mines verified the fact that certain dusts that explode violently when dry are rendered inert by proper humidification of the atmosphere within the gallery, and the importance of humidity as a factor in limiting the inflammability of coal dust in a mine is demonstrated by the fact that there has never been in Illinois a dust explosion during the summer months, whereas the records show a number of dust explosions during cold weather. It is easy to see that the warm moisture-laden air that enters a mine in the summer must deposit moisture on cooling, whereas the cold and relatively dry air that enters in winter must take up moisture as it becomes heated in traveling through the mine.

The *ex parte* presentation of a case should not be depended on to ascertain the full truth, as in many instances such presentation may be positively misleading. Some of the facts given in the above statement apply only to conditions peculiar to coal mines in Illinois and do not apply to conditions in mills in the same state where dust explosions have occurred and their occurrence was also confined to the cold season of the year.

The use of these facts of limited application, with the obvious intention of creating the impression that the principal cause of all dust explosions in Illinois was the increased dryness of the dust in winter, is objectionable; because, although the facts may seem to furnish a plausible and easy reason for the persistent occurrence of explosions in the mines during the colder months, they fail utterly to explain the likewise persistent occurrence of explosions in the mills in winter, and therefore the truth of the inference suggested in the bulletin becomes a matter of doubt even if it is applied to mines only.

Initiation and Propagation of an Explosion

There can be but one process of starting and propagating explosive combustion, and it must be essentially the same under all conditions. It must be fundamentally the same whether such combustion takes place in a mill or a mine or whether the primary igniting agent is a spark, a gas flame, a mine fire, a blownout shot or an explosion of firedamp.

In order to discover this process there must first be a thorough understanding of the fundamental facts. Explosive-dust combustion is possible only when the following essential factors are present to participate in its production: 1. Flame. 2. Combustible dust. 3. An air current or draft toward the source of heat, to bring the dust and air in contact with the flame.

It is true that the fineness and dryness of the combustible dust determine in a measure its inflammability and ease of ignition. But although this is a favorable factor, it is not sufficient of itself to cause explosion, which is determined by the rate and completeness of the combustion; and these invariably depend on (1) the temperature of the flame producing ignition and (2) the character of the air supply or draft that brings the dust in contact with the flame.

Illustration Furnished in the Eskmeals Tests

The following case will serve as a fair illustration to show the process by which combustion is brought to the explosive point. In some of the tests in the Eskmeals gallery resulting in explosion a gas flame was about 10 ft. in length and a foot in diameter. The dust was placed on shelves and was put in suspension by the shelves being upset after the gas was lighted. There was no mechanically produced draft, but it is clear that as soon as the gas was lighted the air commenced to move toward the flame. It is obvious also that this movement of air or draft carried with it some of the dust in suspension, which was thus brought in contact with the flame. The ignition of the dust enlarged the flame and increased the heat, and this condition in turn caused a stronger draft, which furnished a greater air and dust supply to further increase the rapidity, range and temperature of the combustion. This progressive process continued until the temperature reached the required point and the air and dust supply provided by the draft was large enough to cause the first manifestation of explosive combustion.

It has been suggested that the presence of draft to bring dust in contact with the flame is not necessary under the assumption that explosive combustion is produced by conductivity or radiation; or, in other words, that the continued explosive ignition of the dust particles occurs in about the same manner as the ignition of a train of gunpowder, strung along the ground and fired at one end. However, the results of numerous experiments have shown the fallacy of this view.

Conclusions Drawn from the Eskmeals Tests

Evidence that the propagation of explosive combustion is produced essentially by the same process that produced the first manifestation of explosive combustion in the gas-flame test may be found in Dr. Wheeler's letter, Coal Age, Vol. 6, p. 761, regarding the effects observed during the progress of certain experiments made at Eskmeals. Following is a brief quotation from the letter:

> The first air movement is the concussion wave from the cannon (which travels with the speed of sound in air at the temperature of the gallery). There is then a pause of maybe a second or two before a rushing noise is heard, and flame can be seen (through small holes in the side of the gallery). When the flame reaches within 150 or 200 ft. of the open end of the gallery these "spurts" and "halts" are manifested by corresponding outbursts of smoke and inrushes of air at the open end. There is an interval sometimes of several seconds between successive spurts of the flame.

*Former state mine inspector, Chariton, Iowa.

It will be noted that in the tests referred to in Dr. Wheeler's letter the primary means of ignition was a blownout shot and, in the other test mentioned above, it was a gas flame. Essentially the same ultimate effects were produced in each case, the only difference being that in the former a shorter method was used of getting the explosion under way, because the blownout shot practically took the place of the first manifestation of explosive combustion in the gas-flame test, thus cutting out the preliminary stages leading up to the production of the first explosive effects in the latter case. Then, as surrounding conditions were the same, the action and effects of the blownout shot in one test and of the first manifestation of explosive combustion in the other were also substantially alike, in kind if not in degree, and therefore the process of flame propagation must have been the same in both. That the propagation of flame was not effected by conductivity or radiation is clearly shown in Dr. Wheeler's letter, for had this been the case, there would have been no "interval, sometimes of several seconds, between successive spurts of the flame."

Dr. Wheeler's observations show that there was no difference, except perhaps in the magnitude of the immediate effects produced by the explosion either from the cannon or any subsequent explosive combustion of the dust. Hence, the immediate effects of the shot from the cannon can be considered as typical of all. The first of these effects was the concussion wave from the cannon, which drove the air and dust away from and beyond the reach of the flame. The latter, being thus more or less cut off from the necessary air and fuel supply, was halted in its progress and began to shrink. As a result its temperature and the temperature of the immediate surroundings decreased. This condition caused the formation of a partial vacuum around the dwindling flame that not only arrested the further progress of the concussion wave, but caused a reflex air movement or counter-current to set in toward the flame. This counter-current again brought sufficient air and dust into contact with the flame to cause a renewal of explosive combustion.

Effect of Draft to Produce Explosive Combustion and Propagation

It will be seen, therefore, that there was no essential difference between the process of propagation and the process by which the first manifestation of explosive combustion was effected in the gas-flame test. In the latter case the draft that brought the air and dust into contact with the flame—a draft caused by the effects of heat only—was comparatively sluggish and weak, while in the other case the draft or counter-current due to both the combined effects of heat and the partial vacuum formed about the flame moved more quickly and was of greater force.

As the explosion progressed, in addition to the partial vacuum about the flame due to the contraction following each subsequent explosive combustion, another partial vacuum developed in the area behind the flame. These two vacuums are separate phenomena, although they may act in conjunction to a greater or less extent. However, their combined action is not essential in the process of propagation, for it was shown above that the effects of the partial vacuum immediately in front and about the flame were alone sufficient to cause a counter-current strong enough to provide an adequate air and fuel supply for the further enlargement of the flame and the renewal of explosive combustion.

It should be understood that in all the tests at Eskmeals, in which the alternate spurts and halts of the flame were observed and where the alternate outrushes of dust and smoke and inrushes of air were both visible and audible, the gallery was open at one end and closed at the other, the cannon being located near the closed end. Every one of these tests furnished unmistakable and conclusive proof of the presence of the counter-current. But there were other tests at Eskmeals with both ends of the gallery open, and regarding their results Dr. Wheeler states in his letter to which I have referred: "No such phenomena (alternate spurts and halts of flame, etc.) occur when the gallery is so arranged that air can enter freely behind the flame."

Influence of the Counter-Current

This closing statement in Dr. Wheeler's letter has been offered as conclusive proof of the faultiness of the counter-current theory, Coal Age, Jan. 9, p. 94, one writer even claiming that there could be no counter-current in a mine having two openings. In answer to that claim I will only mention the fact that in the second Lick Branch explosion the presence of the counter-current was convincingly proved, and that mine had at least three openings to the surface. The fact that a thing is not readily distinguished is not sufficient proof that it does not exist. Under certain conditions, for instance, the exhalations and inhalations of a man may be plainly visible and audible, while under other conditions "no such phenomena occur." Now it would be absurd to suggest that, because the inhalations and exhalations could not easily be distinguished, the man had ceased to breathe.

When the retarding and reflexive influence of the partial vacuum formed in the wake of the flame is materially reduced or perhaps entirely removed, by the access of air from the rear, the following changes in effects may be reasonably expected: 1. A longer forward reach of the flame at each manifestation of explosive combustion. 2. A concussion wave of greater force preceding the flame. These changes in effects, however, do not change the process of propagation. At each manifestation of explosive combustion the concussion wave again forces the air and dust beyond the reach of the flame and the latter halts and recedes because its air and fuel supply is momentarily cut off. The partial vacuum formed in front and about the flame is still of sufficient force to cause a counter-current to set in, which brings again into contact with the flame the air and fuel required for its propagation. The range of this counter-current is probably shorter and its action quicker and more powerful. The intervals between successive "halts" and "spurts" of the flame, instead of lasting sometimes several seconds, according to Dr. Wheeler's observations, are now of such short duration that neither these nor the action of the counter-current can be distinguished by the human eye.

Influence of the Condition of the Air Factor

In view of the above it appears that the condition of the air factor, considered both in a physical and chemical sense, is of much greater importance and influence in starting and propagating explosive combustion than the condition of the suspended dust. Much stress has been laid on the necessity of dust suspension in order to produce explosive effects, yet in many tests where the dust was in suspension above the flame explosive combustion failed to develop, while in other tests made under the same

surroundings, and employing the same kind of dust and the same means of ignition, explosive combustion was produced in every test without fail when the air and dust were forced into close contact with the flame by draft. The former tests furnish additional proof that explosive combustion is not effected by conductivity or radiation, while the latter tests give further evidence that draft action determines explosive combustion and controls its magnitude.

The Illinois Coal-Mine Investigations

If the investigations made by the Bureau of Mines in Illinois had been of broader scope and due consideration had been given not only to the effects of seasonal changes on the state of the dust in mines, but also to the effects of these changes on air and draft conditions affecting the initiation, propagation and intensity of dust combustion, perhaps a different conclusion would have been reached regarding the cause of the persistent occurrence of explosions in that state during cold weather than the conclusion presented in *Bulletin* 83. Ample proof could have been found in Illinois to show that the state of the dust is not the all-important thing.

At the Waukegan starch works three very violent and disastrous dust explosions have occurred during a period of ten years. Like mine explosions, all have occurred during cold weather—two in February and one in the latter part of November. The fact is shown that the state of the dust in the starch works was not appreciably affected by seasonal influences and remained substantially in the same state of dryness the year round. Under the circumstances the explanation given in *Bulletin* 83 that the difference in dust conditions accounts for the persistent occurrence of explosions in Illinois in winter and for their equally persistent absence in summer can have no application in the Waukegan case.

If the fact is accepted that draft-action determines the magnitude of explosive combustion, then we have an explanation that will account satisfactorily for the marked prevalence of dust explosions in winter, irrespective of the fact whether they occurred in a mill, a mine or any other place; because it is a matter of common knowledge that air conditions and draft-action are much more favorable and effective for inciting and hastening combustion in winter than in summer. Many years ago Peckham and Peck, after investigating the Minneapolis mills explosion, called attention to the danger of a draft carrying dust and proved that draft was essential in producing explosive combustion.

Explosion in a Newly Opened Drift Mine

Richard Newsam told of an explosion that occurred in Illinois, Jan. 31, 1907, in a newly opened mine drift. The distance from the drift mouth to the face where the shot was fired was 103 yd., and the drift was wet the entire distance, the water dripping from the roof. There was no gas and no dry dust. The flame extended through the entire length of the entry and 20 ft. beyond the opening. What proof can be found in the conditions surrounding this explosion to support the claim that the dryness of the dust was the principal cause of all dust explosions in Illinois? The explosion occurred in midwinter, air conditions and draft-action were especially favorable and effective in supporting explosive combustion and the Eskmeals tests proved the presence in that drift of strong inrushes of air or counter-currents that stirred up the wet dust and brought it in contact with the flame.

The Royalton Mine Explosion

The explosion in the Royalton mine occurred on Oct. 27, 1914, about 7:25 a.m. It is supposed that the explosion was primarily caused by the ignition of a body of gas, but there appears to be no definite proof to that effect. Regarding dust conditions it is stated that there was but little dust and that the requirements of the Illinois mining law with regard to dampening the dust had been carried out. Regarding weather conditions Oscar Cartlidge, manager of the Springfield mine-rescue station, makes the following statement, Coal Age, Jan. 16, p. 116:

> The barometer at Royalton, at 7:30 a.m., registered as follows, the readings being corrected to a sea-level basis: Oct. 26, 29.98 in.: Oct. 27, 30.42 in.; Oct. 28, 30.15 in. This indicates a rise of 0.44 in. in the 24 hr. preceding the explosion.

Another report stated, "The morning was particularly cold and windy."

Considering briefly the effect of weather conditions in the Royalton mine we find that, as the weight of the oxygen content of a cubic foot of air increases proportionately to the decrease in the absolute temperature of the air, a given space in the mine could contain a greater number of pounds of oxygen for the support of combustion in winter than in summer, and with the same number of revolutions of the fan per minute a materially larger quantity of air would be passing through the mine on a cold than on a hot day.

Influence of Outside Temperature to Facilitate Explosion

The effects of temperature on the manner of the flow of air in a mine are very marked. If the men in charge of the Royalton mine will select a place on the intake, say ¼ mile inby from the downcast shaft, and measure at convenient intervals the velocities of the air current at points near the roof and near the floor, they will find that with the outside temperature higher than that in the mine the velocity of the air will be greater at the roof than at the floor. Again, with the outside temperature below that of the mine it will be found that the reverse of this is true and that the greater the difference of temperature the greater will be the difference in these velocities.

This fact is important, because explosive combustion is determined in a large degree by the manner of the draft-action that brings the air and dust into contact with the flame. A noticeable difference is observed in the flame of a safety lamp when the air supply enters the lamp above instead of below the flame. In the mine the stronger dust-carrying draft near the floor, in winter, is most effective in producing explosive combustion as it impinges on the flame. The truth of this has been proved in a number of tests.

Effect of Barometric Changes

The fact that the barometer indicated a rise of nearly ½ in. in the 24 hr. preceding the Royalton explosion is rather important. An increase in atmospheric pressure is generally considered a protection against the occurrence of a gas explosion to the extent that it tends to diminish the outflow of gas from the strata, but considered in respect to the occurrence of a dust explosion a rising barometer should be looked upon as a sign of danger. The rise of the barometer at Royalton of nearly ½ in.

indicated that the weight of the oxygen content of that mine was increased about 1½ per cent.

At my place of residence in Iowa a sudden drop in temperature was noted during the night of Oct. 26, and a similar sharp change in temperature probably occurred at Royalton, for it was stated that the morning of Oct. 27 was "particularly cold and windy." Supposing this sudden change in weather conditions had the effect of lowering the mine temperature, say 5 deg., the weight of the oxygen content of the mine would then have been increased another 1 per cent. Now, if the presence of less than 1 per cent. of methane tends to increase the magnitude of dust ignition, surely an increase of more than 2 per cent. in the weight of oxygen per cubic foot of air cannot be without effect in the same respect. The French advice regarding the unraveling of mysterious social happenings is, "Look for the woman." The advice regarding the explanation of mystifying phenomena in connection with dust explosions might well be, Look to the air factor.

Position of Cannon in Testing Gallery

The British Explosions in Mines Committee stated that by placing the cannon 50 ft. *from* the closed end of the gallery better effects could be obtained than by placing the cannon right *at* the closed end; but the committee offered no explanation regarding the cause of the difference in these effects. Following this suggested advice we find that in the former case the air supply furnished by the counter-current could reach the flame from one direction and through one channel only. The supply of air being somewhat limited on that account, the initiation of explosive combustion was comparatively slow and uncertain. When the cannon was 50 ft. away from the face explosive combustion was more readily effected and of larger scope, because in addition to the air supply by the counter-current there was another air supply from the rear caused by the rebound of the momentarily compressed air between the cannon and the closed end of the gallery.

The Bruceton Mine-Explosion Tests

A number of so-called "preliminary tests" made in the Bruceton experimental mine failed to produce explosive combustion, although the kind, amount and disposition of the dust charge and the powder charge were the same as in other experiments in that mine that resulted in explosions. Apparently no attempt was made to locate the cause of the failures, and the matter was disposed of with the assumption that the range of dust suspension had probably not been extensive enough. Why should the investigators at Bruceton be satisfied with assumptions when they have the best facilities in the world to obtain conclusive proof? They could have controlled the extent of dust suspension as readily as they did control the firing of the shot. Had they done so, they would probably have found that the cause of the failures was not the insufficiency of dust suspension, but, as further investigation might have shown, the cause was probably insufficient draft and a counter-current that was too weak to propagate explosive combustion.

It has been said that the fact of the existence of a counter-current during the progress of explosion is of no practical value in supplying means for its prevention. Possibly this is true; but, nevertheless, the success of patented devices, as the Rice barrier for instance, depends on the action of the counter-current to drive the solid or liquid extinguishing material against and into the flame. The proof of the existence of the counter-current permits us to develop definitely and accurately the process of propagation of explosive combustion, and in that fact lies its greatest value, for it has been admitted that accurate knowledge of that process is essential in devising the right means of prevention.

More than three years ago the chief mining engineer of the Bureau of Mines made the following statement: "The principal object at the present time is to determine how and why coal dust explodes, in order that means of prevention and limitation may be suggested from the experiments, and be tried out subsequently." Surely, in the time that has elapsed some progress must have been made in this direction. If the process of explosive combustion has been discovered at Bruceton it should be made public without delay; if it has not been discovered it would be interesting to know what obstacles are in the way.

The general recognition of the fact that air and draft conditions largely control the initiation and propagation of explosive combustion will prove to be of greater value in preventing dust explosions than the application of any artificial remedy so far proposed, because the knowledge of the preponderating influence of the air factor will permit the men in charge of mills and mines to note the danger signs which, before having that knowledge, they were unable to see, and they will thus be better prepared to avert a threatening disaster.

Kentucky Mining Institute

Several hundred of the leading coal operators of Kentucky were present in Pineville, Ky., on Friday and Saturday, May 14 and 15, at the first-aid field day and annual meeting of the Kentucky Mining Institute.

Much of the first day was devoted to field demonstrations, and about 250 of the early arrivals took an all-day jaunt through the fields of Bell and Harlan Counties. They inspected the plants and workings, stopping at Coxton, Ky., for lunch, where Kenneth U. Meguire, of Louisville, president of the Harlan Coal Mining Co., and John W. Williams, of Harlan, representing the Lick Branch Coal Co., were hosts.

Among the principal speakers were Frank H. Cassell, sales director of the Belknap Hardware & Manufacturing Co., of Louisville, who spoke on "The Growth of the Coal Industry in Eastern Kentucky and What This Means to Louisville Commercial and Manufacturing Interests," and William J. von Borries, who spoke on "The Coal Fields of Perry County." Other papers were: "Good Roads Legislation and Its Effects on Southeastern Kentucky," by Jos. F. Bosworth, Middlesboro, Ky.; "The Coals of Eastern Kentucky," by Frank Haas, Fairmont, W. Va.; "The Goodman Straight-Face Mining Machine," by H. H. Small, Chicago, Ill.; "The Coal Fields of Harlan County," by Walter R. Peck, Big Stone Gap, Va.

A great deal of unnecessary wear in working parts of machinery could be avoided if the nature and application of lubricants were properly studied. Too much oil should never be used, and it should be the special care of the workman to see that it is uniformly distributed and regularly applied. One dry spot on a bearing causes heat, and cutting is bound to follow.

Driving Gangways in Anthracite Mines by Improved Method

By Charles C. Phelps*

SYNOPSIS—The substitution of electrically driven mine-car compressors and Jackhamer drills for drilling both coal and rock in place of hand augers and rock drills resulted in greater speed of driving as well as the saving of considerable time.

This article refers to the results obtained in mining anthracite coal by the use of Jackhamers and electrically driven mine-car compressors by one of the large coal-mining companies operating in the Scranton district of Pennsylvania. One of the collieries of this company was recently visited by the writer after the above-named equipment had been in service about seven months.

The mine-car compressors here employed are of the Ingersoll-Rand type, as described in the Dec. 12, 1914, issue of Coal Age, and the Jackhamers are of the Ingersoll-Rand "BCR-430" type, as described in the Apr. 3 and other issues. It will not be necessary, therefore, to go into a detailed description of either machine. A large number of these equipments are in use in the various mines of this company for drilling both coal and rock, also for cutting hitches for timbers.

Formerly hand coal augers were used for boring the coal, while Temple-Ingersoll electric-air drills as well as hammer and "jumper" steel were employed for the rock. Whereas two men were required for either machine or hand drilling, as formerly practiced at this mine, it now requires but one man to run a Jackhamer drill, as this machine is easy to operate and, owing to its lightness, may be moved from place to place almost as easily as a shovel or pick.

One feature of the Jackhamer that is particularly appreciated by the drill runner is the improvement in the ventilation at the face due to the air exhausting from the drill.

*Ingersoll-Rand Co., 11 Broadway, New York City.

Although some of the holes are drilled downward, most of them are projected horizontally for blasting from the solid. Probably three out of every four holes are horizontal. The blast holes are drilled to a depth of 6 ft. with changes of steel varying by a foot. A set comprises lengths of 2½, 3½, 4½, 5½ and 6½ ft. of hollow hexagon steel with cross-bits of such size that the bottoming diameter permits of charging with ⅞-in. 50-per cent. gelatin powder. Holes were formerly put in to the same depth and the same strength powder was used, but the holes were of 1½ in. diameter.

With conditions as mentioned above, the rate of progress during one month was 225 ft. of gangway driven, working with one Jackhamer during two 8-hr. shifts per day and driving a section 14 ft. wide comprising 3 ft. of anthracite coal and 4 ft. of bottom sand-rock. The rate of drilling of the Jackhamer in hard coal was observed to be 3 min. for a 6-ft. hole, including changes of steel. It required 10 min. to drill a 6-ft. hole in the sand rock, also including the changing of steel.

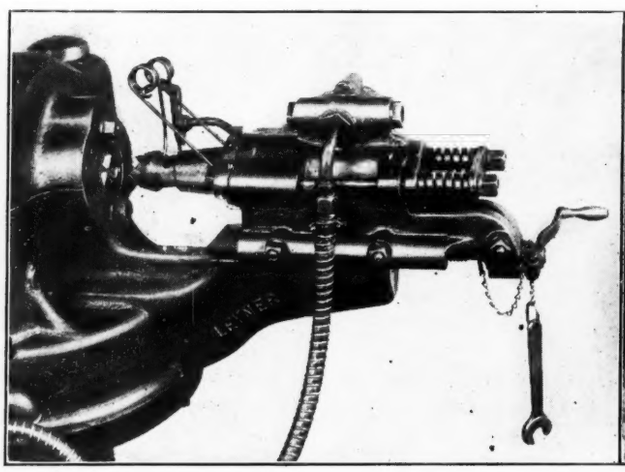


Fig. 1. The Dolly Sharpening a Drill Point

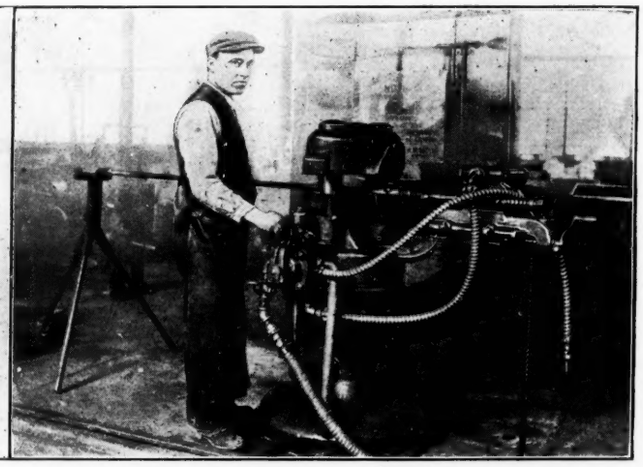


Fig. 2. General View of Leyner Sharpener

The mine-car compressor is transported over the regular mine tracks to a point near the face. It is then derailed and placed to one side and connected with the electric line supplying the trolley system. The drill-runner also cares for the mine-car compressor, no other attendant being required. In fact, about the only attention required by the compressor is an occasional filling of the water jacket, which is of the hopper reservoir type, and replenishment of lubricating oil. In other respects the compressor is entirely automatic in action, an automatic unloader keeping the pressure in the receiver at approximately 100 lb.

The 25-hp. motor which drives this compressor is started and stopped with an automatic motor starter, which is a new development, as hand-operated starters have been employed previously for starting machines in this service. The hand starter has the shortcoming that it depends for successful operation upon a certain amount

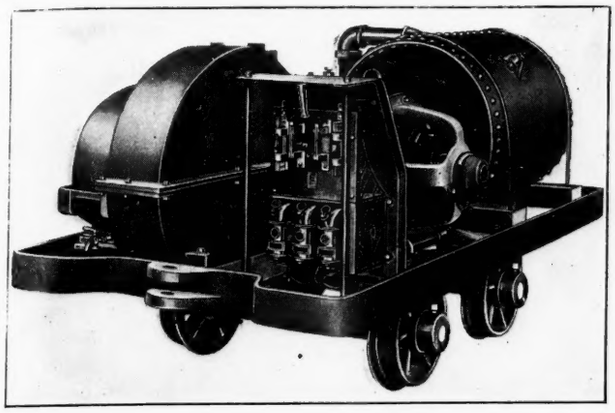


FIG. 3. THE MINE-CAR COMPRESSOR, SHOWING THE AUTOMATIC STARTER

of skill on the part of the operator, and as these equipments are often handled by inexperienced men, it is difficult to prevent abusing the motor when the hand type of starter is employed. With the automatic starter, the knife switch is closed in order to start up, whereupon the motor is smoothly but quickly accelerated to maximum speed. The knife switch is opened when the compressor is to be shut down.

The automatic motor starter may be seen in Fig. 3 showing the compressor car. It is known as a form AK made by the Electric Controller & Manufacturing Co. The copper contacts are protected by dirt-proof covers, which also help to exclude the corrosive gases that are present in coal mines. On account of the extremely wide range of voltage found in the average mine these starters are specially designed to keep the motor across the line, even when the voltage drops to a very low figure. An added advantage of using automatic starters lies in the fact that if power is interrupted the motor will be gradually restarted without further attention when current is again restored.

The steels used while making the observations referred to were sharpened by hand. Since that time several Leyner drill sharpeners have been purchased for the company's various mines. One of these is shown in Fig. 2. Three coal forges located near the sharpener are used for heating the steels. The bit is first inserted between the forming blocks, and the heavy cross-head forges the bit to approximate cross-section. It is then inserted in the dies in the center of the machine and the cross-head is lowered to grip the steel tightly. The dolly then reciprocates rapidly, striking the end of the bit a succession of light blows, compacting the metal and sharpening the bit.

FIG. 4. STARTING A HOLE

The sharpener is operated by compressed air, and its action is controlled entirely by the single lever shown in the illustration. After sharpening, the steel is reheated to a cherry red and hardened by dipping in a pail of water upon the surface of which floats about ½ in. of crude oil. The shanks are formed in the same machine and are hardened for a distance of about ¼ in. from the end.

By means of the Leyner sharpener the time required for sharpening steel is greatly decreased, giving the blacksmith more time for other duties. At the same time a much better and more uniform quality of work is obtained. The method of hardening described has proven satisfactory, resulting in very little broken steel.

Decrease in Coal Production

Production of coal in the 24th bituminous district of Pennsylvania in 1914, as compared with production in the same district for 1913, is given by Nicholas Evans, inspector, as follows:

Names of Operators	Tons, 1913	Tons, 1914
Berwind-White Coal Mining Co.	3,841,715	3,351,406
Valley Smokeless Coal Co.	416,261	286,835
Scalp Level Coal Mining Co.	140,000	208,798
Lackawanna Coal & Coke Co.	341,222	189,989
Smokeless Coal Co.	113,581	125,054
Maple Ridge Coal Co.	75,418	122,311
Kiskiminetas Coal Mining Co.	96,320	117,601
Victor Coal Mining Co.	67,824	111,600
Lochrie Coal Co.	60,000	106,828
Loyalhanna Coal & Coke Co.	10,803	102,585
Ninevah Coal & Coke Co.	63,985	82,835
Morrellville Coal Mining Co.	.....	82,807
Bird Coal Co.	.....	81,524
Sunnyside Coal Mining Co.	137,194	69,743
Lacolle Coal Mining Co.	129,761	64,903
Shade Coal Mining Co.	143,512	59,584
Grazier Coal Mining Co.	.....	56,173
James Turnbull & Son	.....	49,131
Armerford Coal Mining Co.	21,019	40,533
Rummel Coal Co.	60,025	38,740
Arrow Coal Mining Co.	.....	37,250
A. J. Haws & Sons, Ltd.	17,888	35,388
Carmer Coal, Coke & Stone Co.	.....	29,889
Bolival Coal & Coke Co.	22,247	27,838
Shade Creek Coal Co.	.....	27,198
Climax Coal Co.	31,034	20,612
Fairfield Coal & Coke Co.	.....	19,227
Joas. Soisson Fire Brick Co.	14,704	16,732
Highland Coal Co.	13,706	14,901
W. G. S. Robertson	10,450	13,340
Cupp & Weller	.....	10,128
Conemaugh Valley Coal Mining Co.	78,902	.....
S. & C. Coal Co.	35,493	.....
C. O. Wilson	7,000	.....
Other operators	.....	3,700
	6,062,961	5,605,981

C. E. Lesher Succeeds Mr. Parker

C. E. Lesher, associate geologist of the land-classification board of the United States Geological Survey, has been assigned by the director of the Survey to take charge of the work of compiling the statistics of coal production published in the annual volume, "Mineral Resources." This work has heretofore been directly under Edward W. Parker, whose resignation from the Geological Survey is effective July 1.

Mr. Lesher is a graduate of the Colorado School of Mines, and after his graduation was engaged in mining in British Columbia until 1910, when he went to the United States Geological Survey. Since then as a field geologist he has had experience in the coal fields of Montana, Colorado, Wyoming, North Dakota, Washington and Oregon. As a member of the land-classification board, his largest contribution has been in perfecting the scheme for the valuation of the public coal lands, in which it has been necessary to utilize a large amount of statistical data of various types.

Small Steam Turbines at Coal-Mine Power Plants

By R. M. Rush*

SYNOPSIS—Cost of power production at coal mines is seldom known accurately, with the result that machinery has often been installed which was highly extravagant in steam consumption. The steam turbine possesses many advantages over reciprocating engines where condensing water can be secured. In many instances mine water may be used for this purpose with excellent results.

The cost of producing power for the operation of coal mines has long been an unknown quantity with the average coal operator. He has felt that inasmuch as coal is cheap to him, a producer, the matter of power cost made little difference, and hence the class of apparatus used for power production was in many cases of the poorest type as regards economy.

Fire-tube boilers hand-fired and carrying low steam pressure and driving simple noncondensing engines were employed in nearly every instance. Often feed-water heaters were not employed. The question of reliability alone concerned the operator. With this state of affairs central-station power, generated by efficient condensing steam turbines with high-pressure boilers and automatic stokers, was usually able to show a saving over the inefficient noncondensing engine, and many coal operators adopted central-station power regardless of their own cheap fuel.

Owing to local conditions such as exceedingly bad boiler feed and a lack of condensing water, central-station power is often better for the producer than operating his own plant, but to compare this source of energy with inefficient apparatus is manifestly unfair.

With the advent of the small steam turbine the situation has been largely changed. A comparison of a modern, uptodate condensing turbine plant for operation of a mine with the purchase of central-station power in nearly every instance is found to favor the local plant, provided condensing water is available. It is the purpose of this article to tell of some interesting installations in coal mines where small steam turbines have been employed; that is, turbines below 500 kw. that have been installed for the economic generation of electric current.

Fig. 1 is a photograph of one of two 300-kw. high-pressure condensing turbo-generators installed at the plant of W. J. Rainey, at Allison, Penn. These machines are designed for a steam pressure of 125 lb. and for 27 in. of vacuum, under which conditions the guaranteed steam consumption per kilowatt-hour is about 22 lb. Condensers of the barometric type are installed. These were guaranteed to produce 27 in. of vacuum, but were of such ample size that the vacuum actually obtained was approximately 29 in. all the time. This reduced the steam consumption of the turbine to about 20½ lb. per kw.-hr., or approximately 15 lb. per brake hp. per hr.

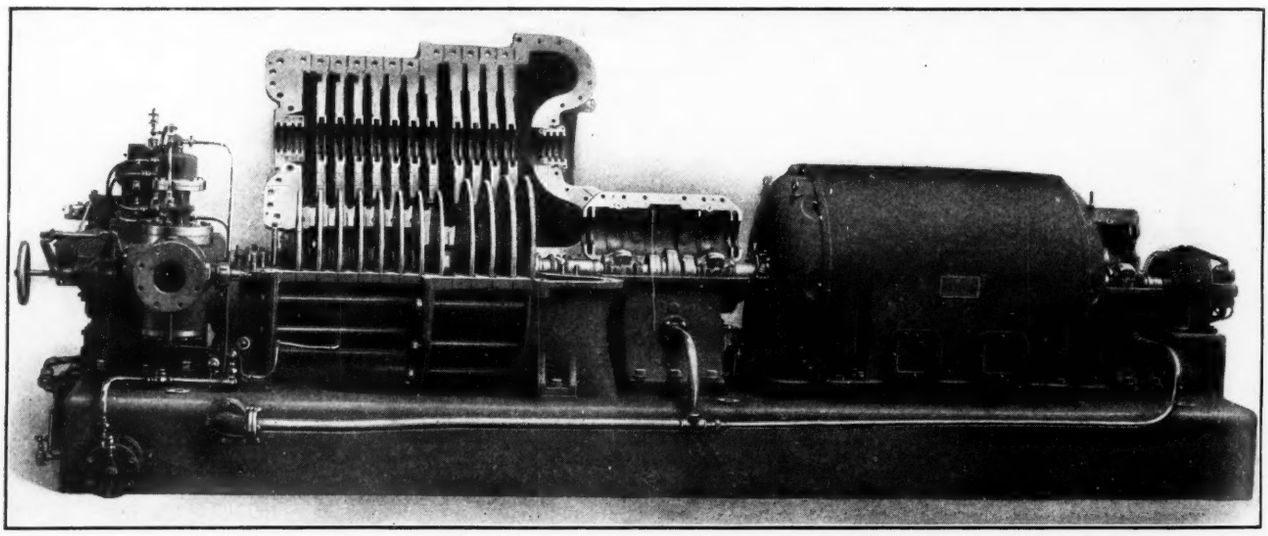


Fig. 1. A 300-Kw. Turbo-Generator with Upper Half of Turbine Casing Raised Showing Turbine Disks

This compares favorably with the average noncondensing engine, the consumption of which is from 26 to 35 lb. per i.hp. per hr. The load curve of a steam turbine, furthermore, is practically flat, since the entire rotor revolves in a vacuum during periods of light load. A noncondensing engine, however, nearly doubles its steam consumption per brake horsepower-hour at light load. A coal-mine load is always fluctuating, and this fact alone places the steam turbine far ahead of the reciprocating engine for coal-mine service.

A Turbine Has Many Advantages

There are numerous other advantages possessed by uptodate steam turbines over the old-fashioned steam engines. A turbine requires no cylinder oil. This in itself is a considerable saving, but it also means that the

*Kerr Turbine Co., Pittsburgh, Penn.

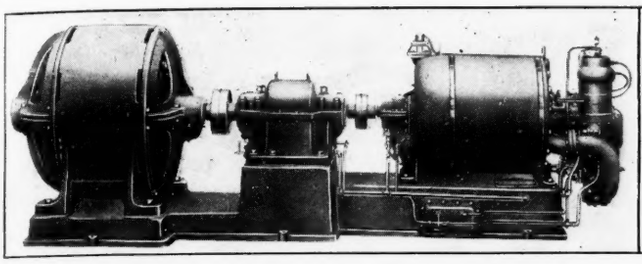


FIG. 2. A 200-KW. 550-VOLT D. C. TURBO-GENERATOR FOR 2-LB. INLET PRESSURE AND 27 IN. OF VACUUM

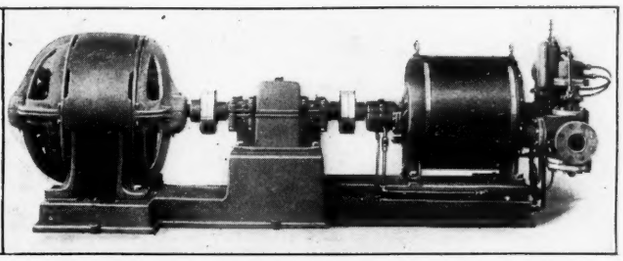


FIG. 3. A 75-KW., GEARED GENERATING UNIT INSTALLED NEAR BROWNSVILLE, PENN.

condensate can be returned to the boilers free from oil and that oil is eliminated in the feed-water heater. The repairs on a steam turbine are considerably less than on a steam engine for the reason that there are no rubbing parts in the turbine. Oil under pressure is circulated to the bearings, cooled and recirculated, so that often a barrel of lubricant will last for a year. Leakage loss alone renders oil renewal necessary.

The question of a condenser for the production of vacuum has been a bugaboo to the average coal operator. At the plant of W. J. Rainey, referred to, the water for condensing purposes is typical of the average coal mine. It is highly impregnated with sulphuric acid and utterly unfit for boiler feeding, yet with the type of condenser employed there has been no trouble whatever with this part of the equipment. The barometric condensers here installed are constructed with the distributing cones made of monel metal, which is highly acid-resisting. Water flows through the condenser at a low velocity, so that erosion is practically negligible.

The pumps which supply the water to the condensers are made of acid-resisting bronze. They are of the double-suction centrifugal type. The head is comparatively low, so that wear on the pumps is slight. The water discharges from the condenser by gravity, so that there is no withdrawal pump to deteriorate as is the case with the low-head jet condenser.

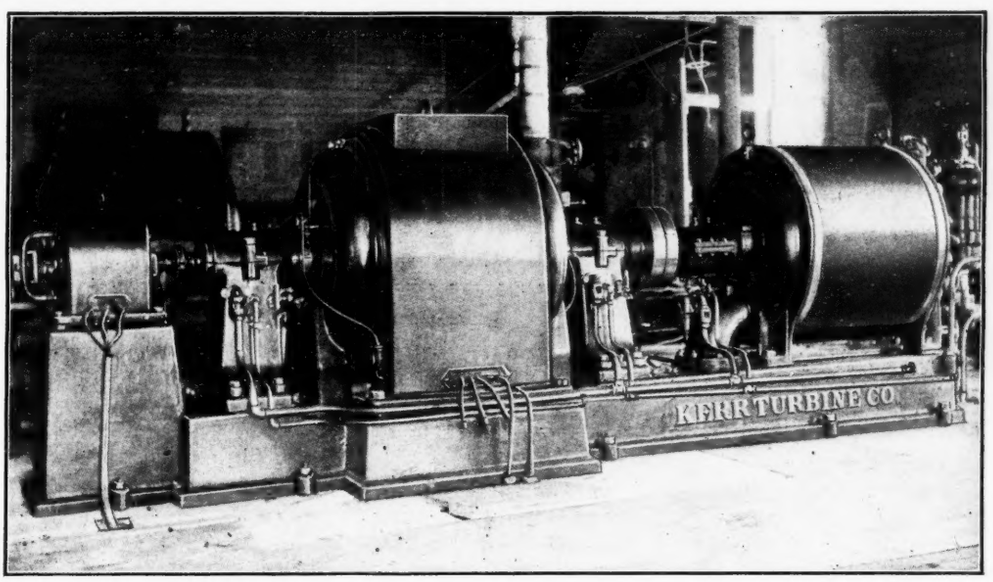


FIG. 4. A 625-KV.-A. TURBO-ALTERNATOR INSTALLED AT NORTH KEMMERER, WYO.

In this plant, as stated, the water conditions are about as bad as exist at any mine, yet the vacuum obtained is from 28 to 29 in., and everything points to freedom from trouble owing to acid. At this plant water for the boiler feed is obtained from a reservoir in the hills, so that there is no need of returning the condensate to the boilers, and hence a surface condenser was not considered in this installation.

A LOW-PRESSURE TURBINE AND CONDENSING PLANT

At another plant in the same vicinity, water for boiler feed is not readily available. At this plant, there are a number of noncondensing engines in operation, and an extension is planned which requires doubling the electrical equipment. This could be obtained by the installation of noncondensing engines and more boilers, but it is proposed to gather the exhaust steam from the existing noncondensing generator engines, from the fan engine, the hoist engine and the pumps into a main header and use this in a low-pressure steam turbine. There is sufficient exhaust steam to double the present electrical output without additional boiler equipment.

As has been stated, considerable trouble has been caused in the boilers owing to bad feed water, and hence it is proposed to install a condenser of the surface type large enough to condense all the steam at this plant and return it as pure distilled water to the boilers. This means that a condenser with copper tubes properly tinned to resist corrosion must be installed. All the steam that is needed will be utilized through the exhaust turbines, the remainder flowing through a special valve around the machine into the condenser. This installation, therefore, will double the present power output with the same coal consumption and eliminate boiler trouble.

At the plant of the Westmoreland Coal Co. a somewhat similar installation has been made except that a condenser of the jet type was used. Water from the mine pumps highly impregnated with acid is discharged to a cast-iron standpipe made up of old pump cylinders, overflowing this to a jet condenser. In this plant 200 kw. of power was produced from exhaust steam, and it was possible to shut down two high-pressure boilers with a

resultant large saving in coal. This condenser worked out satisfactorily, except for the fact that the high water velocity through the nozzles caused considerable erosion and corrosion.

Additional installations are now being made in which the barometric type of condenser will be employed. The lower water velocities of these condensers will probably eliminate corrosive troubles. The condensers will be wood lined so that the acid water cannot come in contact with the metal of which the condenser is made.

The fact that power can be produced from exhaust steam is one which is often overlooked by coal operators. The only thing necessary is a sufficient supply of condensing water, and when this can be obtained from the mine water (which has to be pumped away anyway), it is a decided mistake to continue installing high-pressure boilers and noncondensing engines for increased power requirements.

The reliability of present-day steam turbines is evidenced by their continued purchase after initial installation. For instance, the Kemmerer Coal Co., North Kemmerer, Wyo., installed in 1910 a 150-kw. turbo-alternator, built by the Kerr Turbine Co., Wellsville, N. Y. In 1911 a 250-kw. unit was purchased, while in 1913 a 625-kv.-a. machine was also purchased.

Extracts from a Superintendent's Diary

The curse of gold—it shows its color even in a mining town. To-day the county sheriff came into our camp with a warrant calling for the arrest of John Stewart, and as he left with John Stewart in his custody probably not a man, woman or child in the camp resented his mission. And yet not more than three years ago John Stewart was one of the most popular young men of our community and his popularity was merited.

John came into our camp about five years ago. He had been employed in our company's general office as an accountant and was sent out to take a check clerk's place temporarily. The temporary position developed into a permanent one because the check clerk finally died and John accepted the vacancy.

Being city bred he was surprised at the way our citizens allowed their earnings to slip through their fingers and how then in a few days they would agree to any kind of terms in order to obtain small loans necessary to tide them over until the next payday.

In time the novelty of seeing men pour their earnings into a sieve, as it were, wore away, and one day John awoke to the fact that here were wonderful possibilities. He got his cue from a young fellow who came up to the check window to draw a check, but had to be refused because his earnings had been overdrawn. The man begged John to make him a small loan and volunteered to repay at the rate of two for one on the following payday. John hesitated but recalling that this was done every day, finally consented. After that he hesitated less and less, and in a few months his slight capital suggested astonishing possibilities.

Soon he got to a point where he not only took all loans offered, but even suggested them, and then in a short time he began to invent ways and means of encouraging his associates' extravagances, having in mind the inevitable personal profit that would result. And during all this time he was well within the law, was popular with most of his associates and was considered a valuable employee by his superiors.

One must question if he could tell when he began to have fear for the law or found it necessary to doubt the sincerity of his associates, but once fully convinced that such was the case he became a changed man and his easy temper and suavity gave way to austerity and moroseness.

Then it was that the lust for gold became a matter of life and death with him, and one by one all of the ties that bound him to friends and to ideals were loosed by the vision that had intoxicated his brain. When the inevitable crash did come, he was left dazed and friendless like a lone survivor from a wrecked ship.

The men who induced him to try his luck on the stock exchange were indirectly responsible for his downfall, since he tried to cover his losses there by a forgery, but they never saw him and are entirely ignorant of his fate. Often, no doubt, he will curse them mightily, and he in turn will be denounced just as often by the victims he left behind in our camp. But it is doubtful if he or a single one of his victims will associate his undoing with the chance opportunity that overcame his prejudice against usury and seemed to offer the way to riches.

If I keep on moralizing, I'll have to take up preaching.

Decreased Receipts of Coal in Brazil

From a steadily increasing importation of coal through a period of years prior to 1914 there was a marked decline during last year, or a total importation to the value of $12,209,561 as compared with $19,505,066 in 1913, says Consul General A. L. M. Gottschalk in a supplement to *Commerce Reports*. The coal trade of Brazil is shared between Great Britain and the United States, and although Great Britain still furnishes by far the bulk of the local supply ($16,670,780, or 85 per cent. of the total in 1913), the receipts of Cardiff and Newcastle coal declined in 1914 to $9,950,795, while the imports from the United States (chiefly Pocahontas) increased to $2,242,651 in 1914 as compared with $2,162,098 the preceding year.

The gradual introduction of oil (and in some cases wood) fuel in some of the Brazilian railroads met the scarcity of coal here brought about by embargoes, scarcity of bottoms and the high freight and insurance rates of the war. But there is here an important market in which American exporters should have a greater share during the present stringency.

Record Haul with One Mule

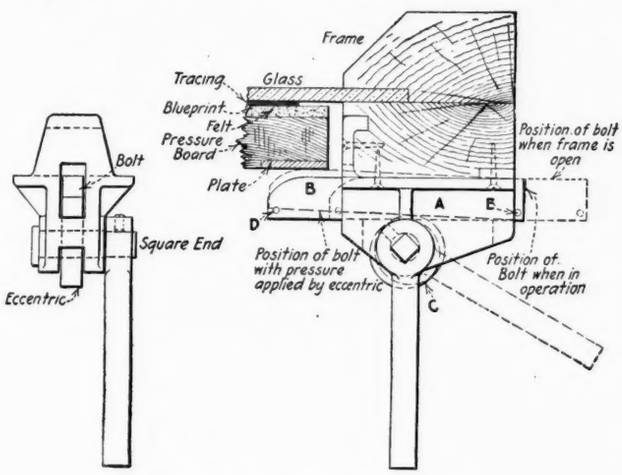
On May 18, 1915, Lindsey Shorts, a mule driver in No. 4 mine of the West Virginia-Pittsburgh Coal Co., Wellsburgh, W. Va., gathered 152 cars of coal and rock with a single mule from the rooms and entries and delivered them to a parting.

The minimum distance on this haul was 1200 ft. and the maximum distance 2500 ft. The cars were of 2-ton capacity and were hauled in an 8-hr. day. In this district about 40 to 50 cars are considered a day's work for a single mule; the haulage of 152 cars is the best I have ever seen during this time.

Clamp for Blueprint Frame

F. J. Hibberd in the *American Machinist* describes a clamp for blueprint frames for use in those drafting-rooms where the electric blueprinting machine has not been introduced, but where the old-style sun frame still exists. There are many devices used for clamping the pressure board down on the back of the frame so as to give the necessary close contact between the tracing and the glass. The common door-bolt, which is the device generally used, is a most unsatisfactory means of securing this contact.

The illustration shows an improved method. It is composed of a brass bracket *A*, which is fastened by



DETAILS OF BLUEPRINT CLAMP

screws to the side of the frame. It has a sliding piece *B*, which can be moved in and out by hand like a "bolt" and is so designated in the illustration.

Underneath this bolt is an eccentric disk *C*, which is fastened to a pin and has a hand lever fitted in its square end. When the bolt is shot into place, the lever is pulled over to the right, as shown by the dotted lines, and the eccentric disk forces the bolt up in the direction of the pressure board, thereby pressing the tracing against the glass of the frame. There are pegs, *D* and *E*, to limit the movement of the bolt. Of course in actual use the whole appliance is reversed and so remains till the clamping is complete.

A Practical and Convenient Mine Stopping

BY RALPH W. MAYER*

A mine in which the pillars are taking weight from the overburden is likely to have its concrete stoppings crushed or cracked, rendering them worthless.

Squared timbers cut about 2 ft. long and of any convenient dimensions, usually about 4 in. square, stacked up like brick lengthwise with the crosscut and with a little sand or cement laid between the blocks, make a stopping that becomes more compact the tighter it is crushed together by the weight of the overburden. Burlap or calking and wedges should be tightly driven between the blocks and the ribs and roof.

*Roslyn, Wash.

Props which have been pulled out of the gob and which are too short to be used a second time in the rooms can be utilized instead of the squared timbers, piling them like cordwood in the crosscut, with sand or cement between them, and tightly wedging them in place. A coating of cement or mortar over the end of the stopping will prevent air from leaking through any small cracks which may exist before the timbers and sand get crushed together.

Forty-penny spikes driven into the ends of the props or squared timbers before the cement is applied will help to hold the coating of cement from falling off.

A stopping which may possibly be exposed to the heat of a mine fire and the crushing weight of the overburden and is to be built in a wide opening such as an entry can be built double. The inside stopping is made of 1x12-in. boards nailed to props wedged between the floor and roof.

The outside stopping is set back in the entry 6 to 10 ft. from the inside stopping, the distance depending upon the height of the coal seam. It is built of 12x12-in. squared timbers laid across the entry and walled up one on top of the other. Hitches or channels are cut in the floor, roof and ribs to receive the timbers. A thin layer of cement or mortar is put between the timbers and at all the joints.

The space between the two stoppings is packed tight with fine dirt as the outside stopping is built up, extra care being taken to pack the dirt tight up against the roof before the outside stopping is sealed. A coating of cement or mortar is spread over the surface of the outside stopping to close any leaks of air that might possibly exist.

Summer Meeting of the Rocky Mountain Coal Mining Institute

The summer meeting of the Rocky Mountain Coal Mining Institute will be held June 8-10 at Trinidad, Colo. E. H. Weitzel is president and F. W. Whiteside is secretary-treasurer. The committee on arrangements, consisting of W. F. Murray, J. P. Thomas and M. O. Danford, has prepared the following program:

June 8, Tuesday—10 a.m., opening at West Opera House; music; address of welcome by Mayor D. L. Taylor; addresses by leading citizens; music; regular order of business; obituary of deceased members. 2 p.m., paper on "Geology of Trinidad Coal Field," by R. C. Hills; discussion of paper. 8 p.m., moving-picture show at West Opera House, consisting of five reels of pictures from the Bureau of Mines.

June 9, Wednesday—7:30 a.m., special train leaving Santa Fé depot on the Colorado & Wyoming R.R. for Cokedale, Segundo, Primero and other points of interest; box picnic at Tercio. Prize contest in the evening, under the auspices of the Eagles.

June 10, Thursday—9:30 a.m., opening meeting at West Opera House; music; paper on "Use of Electric Safety Lamps," by A. L. Thompson; discussion of paper; paper on "Social Welfare Work," by David Griffiths; discussion of paper. 1:30 p.m., special train over Colorado & Southeastern R.R. to Ludlow, Hastings and Delagua. 9 p.m., banquet at Cardenas Hotel.

Special entertainment for the visiting ladies has been provided as follows:

June 8, Tuesday—2 p.m., reception and cards at the Country Club. 9:30 p.m., after the picture show there will be an open-house reception and dance in the ballroom under the West Opera House; refreshments will be served.

June 9, Wednesday—Special trip to Tercio; interesting contest at night.

June 10, Thursday—9 a.m., automobile trip to top of Raton Pass, where lunch will be served. 1:30 p.m., special trip to Ludlow, Hastings and Delagua. 9 p.m., banquet, cards and dancing at the Masonic Temple reception rooms.

The Labor Situation

SYNOPSIS—The examinations of John D. Rockefeller, Jr. L. M. Bowers, E. S. Gaddis and D. S. McCorkle before the Industrial Relations Commission continue the interest in the Colorado situation.

Mother Jones appeared before the Industrial Relations Commission at Washington, D. C., on May 13 and told her story in her own way without any questions. It would be wrong to heckle anyone with so benign a past. Chairman Walsh found nothing to question. The difference between his attitude toward Mother Jones and J. D. Rockefeller, Jr., was clear evidence of his purpose to make political capital out of the investigation.

Her characteristic reply to the inquiry as to her place of residence is worth repeating: "I live wherever there is a good fight against wrong. I live wherever the workers are fighting the robbers." She was allowed to reveal a selected part of her past, and even went back to 1877, when she aided in the Pennsylvania R.R. strike.

Two Employees, on Dismissal, Condemn the Fuel Company

Eugene S. Gaddis, a Methodist minister, testified on May 19 that he had been in the employ of the Colorado Fuel & Iron Co as sociological superintendent. He said he was dismissed last February because he and a superior official of the company were not in accord, and he had called to the attention of John D. Rockefeller, Jr., and the officials of the company many abuses and conditions of hardship of which the miners complained.

He said he had not informed the public of the injustices because he believed that only by silence could he do good in his work. He declared that the state authorities did not enforce the laws and that the company dominated politics, the justices of the peace being usually company employees. The company controlled the schools and churches, and by systematic oppression drove the men to strike in self-defense.

R. S. McCorkle, a Presbyterian officiating at the Sunrise, Wyo., church, of which we illustrated the interior and exterior in our issue of May 15, stated that he was instructed not to inform the employees that the company maintained the church. He stated that he urged that this be made public. It must have been a profound secret known to 99 per cent. and surmised by the other 1 per cent. His sympathies were with the strikers. When asked why the miners bought guns 10 days before the strike, he declared that the company at that time had supplied itself with machine guns.

Chairman Walsh Is Subjected to Censure

When on the following day John D. Rockefeller, Jr., was examined, the inquiries of Frank P. Walsh were so vindictive that it is alleged his fellow-commissioners privately took him to task. Mr. Rockefeller's remarks mostly declared his lack of knowledge of the facts relating to the Colorado trouble. He stated that he had been intending to visit the mines, but unforeseen business duties prevented.

The chairman strenuously endeavored to have Mr. Rockefeller promise to do certain things, some of which were unlawful, if he thought, on investigation, that injustice had been done to J. R. Lawson. Mr. Rockefeller declared that the company had taken no part in securing Lawson's conviction for murder and that he did not propose to try to overawe the courts.

L. N. Bowers, the treasurer of the company, declared that the strikers had been given an opportunity to meet the representatives of the operators; that the courts were not controlled by the coal companies; that the first violence occurred when the strikers killed a camp marshal; that Sheriff Jefferson Farr, "the king of Huerfano County," was at one time connected with the Colorado Fuel & Iron Co.—in fact, he was a part of it.

He admitted that in the early days an officer of the concern, now dead, organized a partnership between the company and Farr for the conduct of saloons in the mining camps, which were used as employment bureaus. Bowers declared he fought the system of which Farr was the head and that he favored state prohibition as a means of eliminating the control of politicians.

On May 24 the jury before which Robert Uhlich, a union leader, was tried for the murder of Mack Powell, a cowboy, returned a verdict of not guilty on the first ballot. The cowboy was killed during a fight between mine guards and striking coal miners near Ludlow, Colo., on Oct. 9, 1913, during the Colorado coal strike. The evidence presented by the state endeavored to show that the Ludlow colonists were armed and led by Uhlich when Powell was killed by the striking coal miners, but seven witnesses swore that Uhlich was in Trinidad on the day of the battle.

Eastern Ohio Goes Back to Work

The representatives of the operators and miners in the eastern Ohio district met on May 22 and formally signed the wage agreement. The right of the pit committee to leave its work and investigate grievances at its pleasure gave trouble up to the last.

A number of plants in the eastern Ohio district have already resumed operations. They are mines Nos. 1 and 3 of the Rail & River Coal Co., the Crescent mine of the Lorain Coal & Dock Co., the mines of the Glenns Run Coal Co., the Morris-Poston Coal Co., the Hutchinson Coal Co. and the Youghiogheny & Ohio Coal Co.

The work of preparing the other mines for operation is progressing satisfactorily. According to J. M. Roan, the Ohio "mine inspector," most of the mines in the eastern Ohio district are in much better shape than might be expected after an idleness of 13 months.

The Gallagher Amendment Still Unsigned

It is announced that Governor Willis will have until May 27 either to approve or veto the Gallagher amendment to the Ohio anti-screen law which was passed by both houses of the Ohio Legislature. Labor leaders are urging the Governor to veto the amendment, while eastern Ohio operators are advocating its approval. The long time provided for the consideration of the bill is due to a technical error in clerical work, which required the amendment to be returned to the Senate for correction.

Announcement was made last week that 200 miners at the West Wheeling mine of the Lorain Coal & Dock Co. struck because of the employment of nonunion miners. The truth of the matter is that 17 men employed at the West Wheeling mine of the West Wheeling Coal Co., a coöperative concern, refused to work until certain men were discharged. The Lorain Coal & Dock Co. was not involved except as owner of the mine, which is operated by the West Wheeling Coal Co. under lease. The miners resent working with men who worked at nonunion mines during the strike.

Anthracite Button and Grievance Strikes

The anthracite region is troubled with small strikes. On May 19 at the Luke Fidler colliery of the Susquehanna Coal Co. 800 employees went on strike because some of the other men were not members of the union. On the same day strikes of the mine workers at Maxwell No. 20 colliery to secure the settlement of alleged grievances of two driver boys and at No. 4 slope of the Stanton colliery for the abolition of the new checking system were settled, but button strikes occurred at the Lance No. 11, Parrish and Hollenback collieries on that day. These mines all belong to the Lehigh & Wilkes-Barre Coal Co. The union is trying to hold the men to the terms of their agreement, which forbids strikes.

The Anthracite Conciliation Board on May 17 heard the grievances of the employees of the Lehigh Valley Coal Co. and of the workmen at the Shenandoah City colliery of the Philadelphia & Reading Coal & Iron Co. The men complained that those corporations had increased the size of the cars at the mines. The engineers of the Susquehanna Coal Co. also submitted their wage grievances.

COMING MEETINGS

M. O. I. Coal Association annual meeting will be held June 22-25, 1915, at Cedar Point, Ohio. Secretary, B. F. Nigh, Cleveland.

Rocky Mountain Coal Mining Institute will hold its next meeting in Trinidad, Colo., June 8, 9 and 10. Secretary, F. W. Whiteside, Denver, Colo.

West Virginia Mining Institute will hold its summer meeting at Wheeling, W. Va., June 15 and 16. Secretary, E. N Zern, Morgantown, W. Va.

Mine Inspectors' Institute of the U. S. A. will hold its annual meeting June 8, 9, 10 and 11, 1915, at St. Louis, Mo. Secretary, J. W. Paul, Pittsburgh, Penn.

American Society of Mechanical Engineers will hold its summer meeting at Buffalo, N. Y., June 22-25, 1915. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

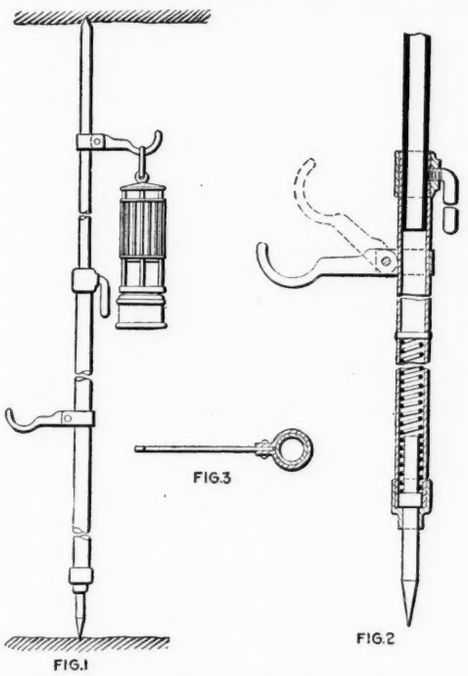
American Mine Safety Association will hold the following meets: June 1, Moberly, Mo.; June 5, Des Moines, Iowa; July 2-3, Big Stone Gap, Va.; July 23-24, Billings, Mont. Secretary, H. M. Wilson, 40th and Butler St., Pittsburgh, Penn.

New Apparatus and Equipment

Believing that one of the greatest services that a journal such as COAL AGE *can render its readers is to acquaint them with new and improved equipment which may be employed directly or indirectly to the benefit of the coal-producing industry, this department is inaugurated. For the present it will appear in the second and fourth issues of each month. We shall therefore be glad to receive from builders, manufacturers or dealers brief descriptions of new or improved pieces of apparatus in which they are interested, the use of which will tend toward better results in or the economic development of the fuel industry or any of its numerous ramifications.*

New Support for Safety Lamps

In the mining of coal where safety lamps must be used the miner is often compelled to work in a position where light is needed near the roof of the mine. Heretofore he has either placed the lamp on the floor, where it was



DETAILS OF THE NEW SAFETY-LAMP SUPPORT

liable to be knocked over and broken, or has driven a nail in one of the posts, or even into the coal of the rib, from which he suspended the lamp. Even under these conditions, he often failed to get the lamp in a position where its light would be most effective.

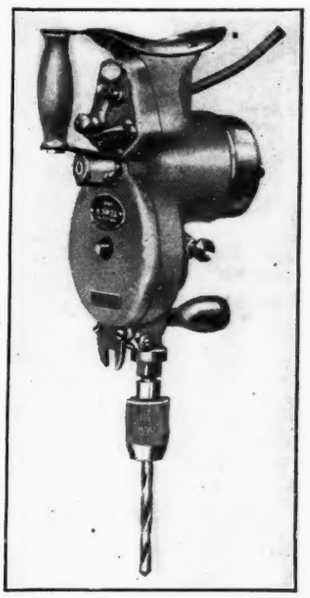
To obviate these difficulties, Charles J. Maher, of Manor, Penn., has invented a safety lamp support. As may be seen in the accompanying drawing, this consists of two pipes, one telescoping within the other and each provided with a sharp point. The lower point or foot of the support is so arranged as to be under the tension of a spring when forced against the mine floor. The upper section may then be pushed against the roof and clamped in position, when the spring-actuated foot will hold the support firmly in place.

Two lamp hooks are provided, one upon the lower section of the support, which is the larger in diameter, and the other upon the upper, or smaller, section. These are so arranged that by folding up the hook proper the yoke which attaches it to the support may be slipped up or down throughout the vertical length of the section upon which it is mounted. Lowering the hook and attaching the lamp holds this hook securely in position.

This support is light and easily portable and will hold a safety lamp in almost any position between the floor and roof of the mine. The support may therefore be so placed and the height of the lamp so adjusted as to give light at the point most needed in the miner's work.

A New Line of Portable Electric Drills

The "Temco" line of portable electric drills recently placed on the market by the Western Electric Co. are especially designed to give long and efficient service under severe conditions and hard usage and are essentially all-around tools.



ONE OF THE NEW PORTABLE DRILLS

These electric drills have the general shape of an ordinary breast drill, are compact in design and light in weight. The weight is well balanced, making handling easy, while the electric switch is conveniently placed near the handle.

A special feature is the ease with which the motor may be reversed when the drill sticks. Whether working at high or low speed, a touch of the switch reverses the motor, loosening the drill or sending it ahead as required. These drills will also tap holes, the reversing feature being here of great advantage.

Temco drills are particularly advantageous when holes are to be drilled or tapped where the material cannot be carried to a drill press. The tool is then carried to the job. They are also handy for working inside objects, or upside down and in other inconvenient places.

The motors are built to operate on either direct or alternating current at standard voltages. The two principal sizes are model B and model C, the former having one and the latter two motors, making it especially adapted to the hardest kind of work.

The motors are of the high-speed commutator type, having forged nickel-steel shafts and built-up cores of magnetic steel. The commutator consists of hard-drawn copper bars of ample carrying capacity forced together under high pressure and insulated by selected mica.

Model B drill has a capacity up to and including ⅜ in. in steel, cast iron or similar substance and weighs 12 lb. complete. Model C has a capacity of ½ in. in steel, has two speeds and weighs without the chuck about 19 lb.

The Western Electric Temco line of tools also includes a tool-post grinder, a valve grinder for automobile engines and a buffer and polisher.

Automatic Safety Lock and Dial Indicator

An automatic safety lock for shaft gates, together with a dial indicator showing whether the gate is open or closed, has been invented by W. A. Williams, of Barton, Ohio. The object of this device is to automatically lock and unlock the gates of elevator shafts, particularly those on the hoisting shafts of coal mines, during the time that men are being hoisted or lowered.

The accompanying drawing shows a cage at the shaft landing, and a gate hinged to a post. On the gate a bar is pivoted which extends through a keeper and is movable vertically at one end. On the face of the adjacent gatepost is a plate with a suitable catch for holding the locking bar.

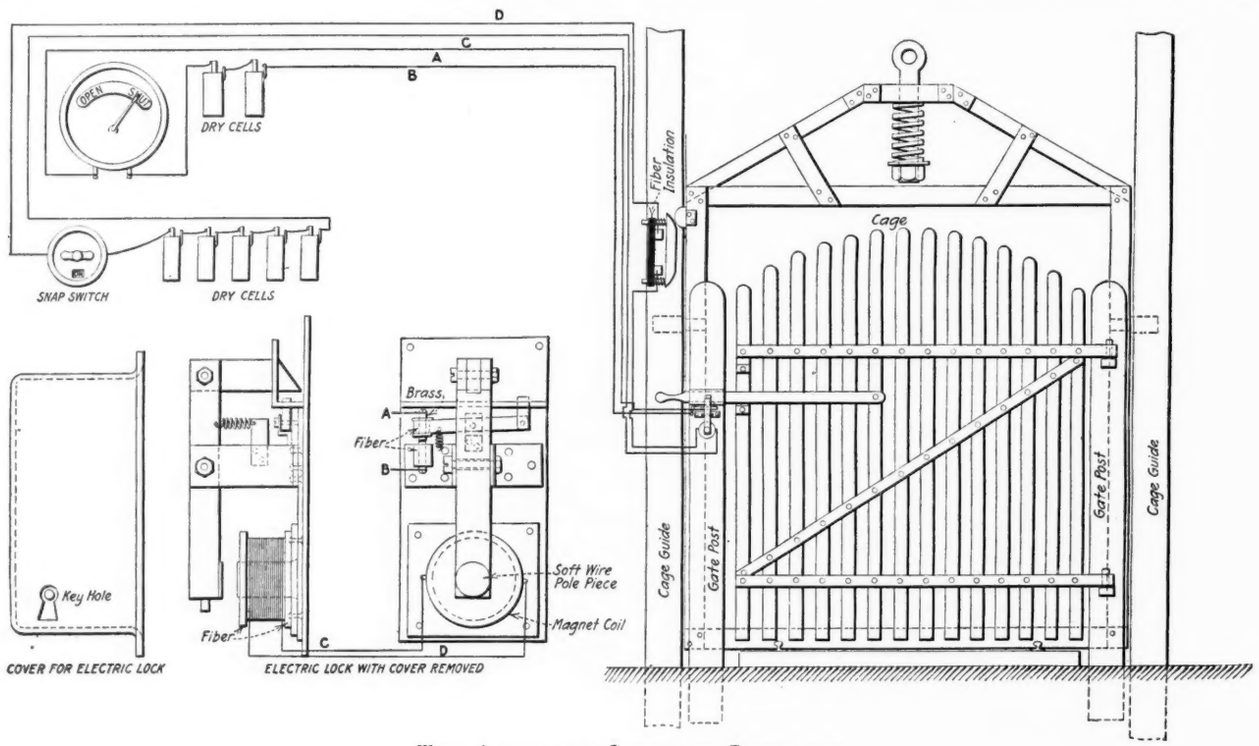
An electromagnet is introduced into the locking mechanism in such a way that when it is energized a bolt is withdrawn from the lock, allowing the locking bar to be swung out of contact with its catch, thus permitting the gate to be opened.

The coils of this electromagnet are included in and form a part of an open electric circuit, one side of which leads from a source of electric energy while in the other is a bridge-piece or switch. When the cage is approaching the position at the landing, a contact mounted upon it closes the circuit, thus energizing the magnet, withdrawing the bolt in the lock and allowing the locking bar to be elevated. If the cage is but slightly moved, however, the contact is broken and the locking bar cannot be moved.

A snap switch is also introduced into the circuit whereby the latter may be broken, rendering the latch bolt inoperative so that the gate is held in a closed and locked position. This snap switch may be located at any convenient point, usually in the engine room.

The electric lock is provided with a cover and so arranged that the introduction of a suitable key will open the lock independently of the electric circuit. This key of course permits of the gate being opened when the cage is not at the landing. It should be carried by some person in authority so that the gate may not be opened and left open by some irresponsible individual.

In the engine room a dial indicator is placed which shows at all times the movement of the latch bar through suitable electrical connections. When the latch bar is disengaged from the locking mechanism, the dial stands at the open position, while when the gate is closed and the latch bar dropped into its place, the dial stands at shut position. Thus whenever the engineer receives a signal to either hoist or lower the cage, he may know at all times whether the gate is open or closed and locked.



THE AUTOMATIC LOCK AND INDICATOR

A New Surveyors' Slide-Rule

The fact that all astronomic data essential to surveying, such as azimuth, time, latitude, etc., can be ascertained by means of an ordinary transit with vertical circle, but without solar attachment, is seldom utilized in this country. The chief reason for this is the difficulty of comput-

ing in the field by spherical trigonometry the result of the observation.

The Keuffel & Esser Co., of New York, has recently placed on the market a surveyor's slide-rule which entirely eliminates this difficulty by reducing the hitherto complicated calculation to mechanical operation, thereby rendering the method of field astronomy with the engineers' transit extremely simple and practical.

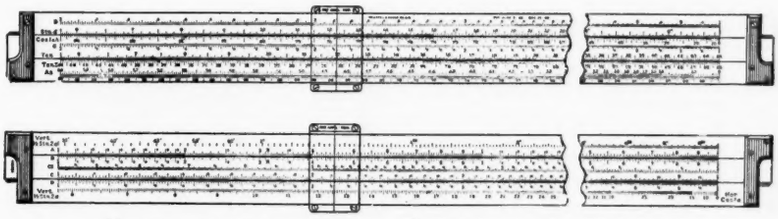
The new rule, which is 20 in. long, of the duplex type, having a double face, has been evolved to meet the requirements of the modern surveyor that demand that it shall be fully commensurate in accuracy with the standard transit, reading to one minute of arc. The scales are conveniently arranged for handling all problems arising in the field, while the length of the rule permits of fine subdivisions on the trigonometric scales, and consequently the necessary accuracy is easily attainable.

One face of the rule is arranged for the determination of the meridian by direct solar observation and solves the formula

$$Cos\ A_z = \frac{cos\ h\ cos\ l}{sin\ d} - tan\ h\ tan\ l$$

with only three settings of the slide and the use of the runner or indicator. This face also has the sine and cosine scale used in computing the latitudes and departures of courses.

This side of the scale has been provided with these features: The regular D-scale; the sine D-scale from 2° 22′ to 24° for declination; the cosine L- and H-scale from 0° to 84° 15′ for latitude and altitude respectively; the regular C-scale; the tangent scale from 5° 43′ to 45°; and the tangent scale inverted from 20° 50′ to 75°; the azimuth scale (which is one of natural cosines) for reading azimuth or cosine bearings for angles from 0° to 60° referred to an adjacent scale of equal parts.



FRONT AND BACK OF THE SURVEYORS' SLIDE-RULE

The other face of the rule has the usual scales A, B, C1, C and D for all general numerical calculating, as well as two stadia scales for computing horizontal distances and vertical heights.

This rule, 20 in. long, with "frameless" glass indicator, in case with directions is catalogued at $18.

Legal Department

Validity of Mining Laws

BY A. L. H. STREET*

The chapter of the Kansas Coal Mine Law which requires operators to maintain bathing facilities for use of their miners on leaving work is sustained as being a valid regulation in a decision recently handed down by the state supreme court (State vs. Reaser, 145 Pacific Reporter 838).

The constitutionality of the law was questioned on the ground that the regulation involves a discrimination against the coal-mining industry, in that operators of lead, zinc, gypsum and salt mines are not subject to the requirement. But the supreme court holds that coal mines constitute a sufficiently broad class to warrant the regulation. Part of the opinion reads:

"The determination of the necessity and wisdom of a police regulation rests, in the first instance, upon the Legislature and if there be reasonable grounds for exercising such power, the court should not interfere, although its judgment might not fully concur with that of the Legislature."

The court assigns as justification for the law the facts that the temperature in mines, the dampness of the atmosphere, and other conditions of mine work render it a great protection to the health of miners that the requirements of the act be observed. "The health of the employee is a matter of concern not only to himself but to the employer and the public as well."

As sustaining the decision, the supreme court refers to cases wherein similar laws have been upheld in other states, and to the following statement made by the United States Supreme Court:

"The regulation of mines and miners, their hours of labor, and the precautions that shall be taken to insure their safety, health and comfort, are so obviously within the police power of the several states that no citation of authority is necessary to vindicate the general principle."

*Attorney-at-law, St. Paul, Minn.

Rupture as Subject of Compensation Award—The West Virginia Workmen's Compensation Act authorizes allowance of compensation for injury or death of an employee, resulting from a rupture sustained in lifting a heavy object in the course of his employment. (West Virginia Supreme Court of Appeals, Poccardi vs. Public Service Commission, 84 Southeastern Reporter 242.)

Right of Miner to Rely on Pit Boss' Promise—Where an operator's pit boss assured a miner that a dangerous defect in a mine track would be remedied by a certain day, the miner was under no legal duty to inspect the place after that time to determine whether the danger had been removed, as affecting his right to recover damages for consequential personal injury. (Colorado Supreme Court, El Paso County Land & Fuel Co. vs. Perdaris, 147 Pacific Reporter, 675.)

Liability of Stockholders of Dissolved Corporations—Under the statutes of Kansas, when a coal-mining company dissolves, leaving unpaid a claim against it for wrongfully mining coal on the lands of another, the stockholders may be held liable on such claim. (Kansas Supreme Court, Abernathy vs. Loftus, 147 Pacific Reporter, 818.)

Editorials

Eastern Ohio Wage Agreement

We are told that the settlement in Ohio should be a source of great gratification. It does not, however, add anything to the national prosperity as the return to work of the eastern Ohio mines will only render idle or less active many operations in other fields. It does, however, spread the evils of inactivity more evenly over the country, and that in itself is a gain.

We congratulate the people of eastern Ohio, especially the operators, because the new contract will make possible a better system of working whereby coal will be conserved and will be prepared in better shape for the market. The rooms have been in the past far too wide, and the coal in the ribs has consequently been lost.

The miners have obtained the letter of their demands—47c. per ton for machine-mined run-of-mine coal—but to get it they have had to make substantial concessions. These may yet make trouble when the schedule comes into operation. When the operators and miners were in session the miners loudly proclaimed that there were to be no concessions on fundamentals, but the letter which Charles J. Albasin, president of the subdistrict, addresses to the miners shows that he has doubts as to the satisfaction of the men with the scale as now signed. In this he says:

> We have done our full duty without any apologies. Now we have reached a settlement with the eastern Ohio coal operators that in our opinion spells victory and vindication of our long struggle. We are fully confident that we did not receive everything for which we were contending, but taking into consideration the tremendous opposition that was continually massed against us and the deplorable industrial conditions surrounding us, we believe that we have done the best possible under the circumstances. We desire to have your full coöperation. Be prudent and self-possessed; don't permit any prejudice to carry away your best judgment.

All this does not spell "sweeping victory" as stated by the official organ of the union. Men do not need to be coaxed into the rôle of victors. And indeed a sweeping victory would have been a sweeping defeat, for the eastern Ohio miners would have been swept into pauperism by such a triumph. While the rate per ton would have been somewhat more than fair, the amount of work the mines would have secured from the market would have been so greatly restricted that the yearly wage of the miner would not have sufficed for his sustenance. It is to be hoped that the concessions have saved the miners from this possibility.

There were formerly about 18,000 miners in the subdistrict. Of these about 6700 have moved away during the 13½ months of idleness, and the operators have agreed to give those who stayed the advantage when selecting workmen. This they should do, seeing that many owe rent for all the time during which they were idle.

The actual figuring of the division of increased pay for cutting and loading would have awarded 7.95c. per ton to the machinemen and 39.05c. to the loaders. The operators insisted on giving the cutters 8c. and the loaders 39c., thus increasing the rate of the cutters 0.629 per cent. and decreasing that of the loaders 0.128 per cent. from the rates which would otherwise have been obtained, but as both were receiving an increase in scale rates of measurable importance these imponderable variations were unworthy of consideration.

The change in distribution between machinemen and loaders was negligible, but it aroused bitter antagonism between them and nearly prevented ratification. It normally should travel in the opposite direction, for as machines increase in their effectiveness the scale rate for cutting should lag in percentage behind that for loading.

Until mechanical loaders or conveyors are introduced, a cheaper explosive is invented or a method of cutting making less powder necessary is put into operation, the work of the loader will hardly become any easier. On the other hand, the work of cutting progressively grows less time-consuming and no revolutionary changes are necessary to make it more rapid.

The idea of the operators doubtless was that the narrow work to be introduced would press more severely on the machinemen than on the loaders and that the percentage between them should be revised accordingly. But there was much bad feeling between these classes of labor and the decision of the operators has increased the tension.

Three of the smaller operators have declared that they cannot make ends meet under the new scale, and George S. Jones, of the George M. Jones Coal Co., of Cleveland, states that the Webb and Pultney No. 2 mines at Bellaire will not be opened owing to lack of business. The new scale is apparently a draw with both sides thoroughly exhausted. Neither side can be regarded as having won a real victory. In fact, like all industrial strife, the end is unsatisfactory to both.

Italian Demand for Coal

The demand from Italy for American coal, which developed almost immediately upon the breaking out of the European war last August, is now certain to be greatly augmented, as Italy's entrance into the war shuts off the supply from Germany. For years Italy has imported annually about 10,000,000 tons of coal and coke, her own production being only about one-fourth as much.

In 1913 Italy imported 9,647,000 tons of coal from the United Kingdom, and in the first half of 1914 the imports were at a slightly greater rate, but the war caused such a reduction that the total for 1914 was only 8,625,000 tons, showing a decrease of 1,022,000 tons for the year.

Italy imported in 1913 from Germany 1,073,000 tons of coal, of which 441,210 tons, or 41 per cent., was shipped via the St. Gothard railway, the remainder being by routes since closed by the war. Statistics are available only through last December, showing shipments of coal from Germany to Italy by the St. Gothard to have been 150 tons in August, 12,000 tons in September, 27,000 tons in October, 35,000 tons in November and 48,000 tons in

December. It is probably safe to infer from these figures that the shipments have increased this year and may lately have been in the neighborhood of 75,000 tons per month. Italy's entrance into the war necessarily shuts off those supplies, and a correspondingly greater demand for American coal is reasonably to be expected.

Journalistic Ethics and Psychology

The ethics of no business is above criticism. It is not therefore surprising that journalistic ethics has its shortcomings. News is perpetually coming to every newspaper and finds its way into the columns. Credit is generally given to the source of the news, except perhaps in cases where credit is not desired and where the facts are not doubted.

In the Colorado trouble for many months the public saw nothing and heard nothing but the ex-parte statements of the agitators. The more distorted these utterances were the more valuable as news items they appeared. What did it matter that they were attributed to Mother Jones or John R. Lawson or other labor leaders? The reliability of these persons as witnesses was a matter of which the public was not competent to judge, and as journalistic ethics requires in the best daily papers that statements shall be made without comment, the accusations of these irresponsible persons received wide publicity without a vestige of contradiction.

After awhile the operators started to circulate their side of the case, and while the story doubtless modified editorials and in some cases inspired them, yet the statements failed to get a place in the news. This is a severe arraignment of the press. It had conscientiously republished all the stories of outrage while it did not publish the refutation.

It was not necessary that these corrections should be published by way of retraction, but they should have been given place as supplementary statements from other authorities. The public never received the views of the operators till the Rockefeller memorandum was inadvertently published, and thus the publicity campaign was largely thrown away.

And this complaint is made not against the yellow press only. There are some papers which stand consistently for right and others which sometimes seem to lean toward capital, but these like the anti-capitalistic papers failed to avail themselves of the news despite the fact that as furnished it was in excellent shape to attract attention and to be prepared for publication.

As a result the papers published much that they knew to be untrue without a hint that they knew it was unreliable. They did not of course in any way guarantee the news, but as they did not contradict or explain it they left it to be inferred that it was true and could not be controverted. Having forbidden editorial criticism in the news columns, having omitted references to the news editorially and finally having failed to print some of the material supplied them, they appeared to take the side of the agitators as if the stand of the calumniators of capital was without possible answer.

The West Virginia strike was handled similarly, with this difference—that at first there was no publicity of any kind and later Senator Martine became the protagonist for the forces of disorder. That legislator fortunately did not make a favorable impression on the public. He is distinctly less interesting in appearance than Mother Jones, while more is naturally expected of him.

It is largely by its judgment of persons that the public is swayed, and the people only began to get their bearings in the Colorado trouble when they compared the character of John D. Rockefeller, Jr., with that of his inquisitor, Walsh.

The public is not disposed to listen to arguments. It lights instinctively on men, and the restful humanitarianism of Rockefeller contrasted favorably with the disturbing vindictiveness of Walsh. The impersonal work of Ivy L. Lee, excellent as it was, failed to effect its purpose because it had a man relatively unknown behind it and could not even be quoted as his.

In the last analysis it is doubtful whether the newspapers' ethics or the operators' psychology of attention was most to blame. If at the first the coal companies had put out a man—the right man—and centered their defense around him, perhaps the papers would have been responsive and the public more friendly. Let us hope that the anthracite operators in the coming strike will be able to center their arguments on a striking, outstanding figure who will be the visible embodiment of their position and whose contentions will be published freely in the public press.

No Fear for the Future

The British are spending $150 a second on the war in which they are engaged and the press is urging on the public the stupendous significance of such prodigality. But we are expending about an equal amount for the running of federal, state, county, city and village governments and improvements. So after all probably Europe is not nearly bankrupt as we think, and a few years of economy—abstinence from liquors, increased devotion to business and reduction in the amount of domestic help—will erase the recollection of the war from the world's markets. Marvelous indeed would be the resources of the world if only everyone will save a little. Ten dollars saved by every citizen of the United States would give us a billion dollars. Little wonder is it that after every business depression trade leaps forward more energetically than ever before.

Explosives in Coal Mines

A letter from one of our readers suggests that mining men generally would be greatly interested in a series of articles covering the use, storage and transportation of explosives in coal mines. Since we agree fully with the idea, we wish to take this occasion to invite any and all of our readers who have had experience with explosives to to tell us (a) what methods they employ in shooting the coal—we would like to describe the system used in each field; (b) where permissible explosives have proved more economical and efficient than ordinary black powder; (c) what depth of borehole and what amount of tamping are employed; (d) remedies for blownout shots; (e) where electric shotfiring systems are successfully used; and (f) how explosives are transported and handled in the mines.

All articles dealing with any of the subjects suggested above will be most acceptable for publication in COAL AGE. Let us hear from all our readers who are qualified by experience to write on the topics outlined.

Discussion By Readers

The Trouble Maker

I am led to make the following comments after reading the interesting account in "Extracts from a Superintendent's Diary," COAL AGE, Apr. 24, p. 716, in which is described very vividly the visit of a delegation of women to the office of the mine superintendent of a large coal corporation. The women were campaigning the state in the interest of a proposed child-labor law.

The account given shows quite clearly that, while these women were no doubt sincere in their purpose and self-sacrificing in their efforts in behalf of good legislation, they had permitted their minds to become prejudiced to the true facts as they existed in and about the mines. They were ready to believe what they had been told—that the operator is a grafting, grabbing baron; they had come to regard the average miner as an inveterate kicker who constantly carries a club. Indeed, in their talk with the superintendent, they acknowledged that they had listened for two hours to the address of a labor leader, who they assumed correctly represented the views of the company and the men. They did not realize that they had been listening to an agitator—a trouble maker.

To the suggestion of the superintendent, after he had patiently listened to what the ladies had to say and had asked them to interview some of the men for themselves, they replied that they were already familiar with the views and the conditions of the miners. They said that the man who had addressed them had requested that they should withhold his name, fearing that he would lose his job if his interest in the matter were to become known.

The speaker had so prejudiced the minds of these women that they could not realize that the representative body of operators and miners alike compose as high a type of capital and labor as can be found in any industry. The fact that the superintendent was willing for these visitors to interview his men should have made clear to their minds that he had a contented lot of workmen whose ideas when expressed would not be at variance with his own and would not be in opposition to the well-known policy of the company.

The incident shows clearly that the agitator is a real trouble maker—a busybody and a menace to the peace and harmony of any mining camp. His purpose is to create a false impression and to bring about a feeling of dissatisfaction among the workmen. He is thus responsible for the larger part of the friction that exists, from time to time, between the miners and their employers. The agitator starts discord by influencing the small and noisy element among the miners to believe that they have a fancied grievance that should be adjusted. It is a comparatively easy task to convince this class of miners that they are being robbed or to make some operators believe that their miners are taking an unfair advantage of them. The submission of these unjust complaints, through a committee or a local union, has the effect to prejudice another *just* complaint in the eyes of the operator who gives the matter slight attention.

In closing, permit me to say that with a contract system in force between the operators and miners, determining the wage scale and the duties of both parties and providing for the settlement of disputes that may arise, there is no logical place for the irresponsible agitator. The way is thus provided by which a real grievance presented by either the miners or the operators acting as a whole can be readily adjusted in a fair and amicable manner. In my remarks I have referred only to the local agitator who goes about looking for points of contact that can be made to develop friction. The elimination and downfall of this class of agitator would go a long way toward establishing industrial peace.

SUPERINTENDENT OF MINES.

New Straitsville, Ohio.

Preventing Mine Explosions

Having read with great interest the letters in regard to rescue work following explosions in mines and the discussion of the question, "What recognition should be made for acts of bravery performed by miners at such times?" the thought occurred to me that it would be well for both miners and operators to give more attention and make greater efforts to prevent the occurrence of these explosions as far as it may lie in their power. By so doing, it will be possible to reduce the number of mine explosions to a minimum.

Many of the causes of mine explosions are so simple and plain as to be recognized at once by all practical coal miners and operators. The question is, What can be done to remove these causes and prevent their natural results? For example, many explosions are caused by the too rapid firing of shots, as well as the firing of shots that the practical judgment of competent men would condemn as being dangerous. The best means of preventing accidents from this cause is by means of strict regulations in regard to blasting.

Particularly in gaseous mines the following rules and regulations should be enforced: 1. No shots should be fired while men are in the mines. 2. All holes should be examined by competent men before they are charged. 3. The charging and firing of all shots should be performed by competent shotfirers after the men have left the mine. 4. The shotfirers should be compelled to proceed with their work slowly. 5. There should be a sufficient number of these men to divide the mine into separate districts, so that one man will not be required to fire from 300 to 400 shots in one or two hours, as is often the case. 6. The shotfirers should be authorized to condemn and refuse to fire any shots that in their judgment would be unsafe.

The object of proceeding slowly with this work is to give the air current time to sufficiently clear away the gases produced in firing and which always to some extent are forced back against the air into adjoining places where shots are yet to be fired. The firing of shots should always begin on the last of the air and progress in a direction

against the air current so that subsequent shots will be fired in comparatively pure air. The velocity of the air current should not be too great; neither should the circulation of air be cut off while firing is in progress in the mine workings.

Another danger inviting mine explosion is the accumulation of gas in old and abandoned workings and void places in the mines. Any heavy fall of roof in these places will force the gas out into the live workings, and its ignition may result in an explosion of gas and dust that may be extended throughout the mine. To reduce this danger to a minimum, all timbers should be withdrawn as a place is finished and every effort should be made to cave the roof so as to close the opening.

Drawing all timber will not only prevent the danger of a squeeze, but will give no opportunity for gas to accumulate in dangerous quantities. Also, the value of the timber recovered will generally pay for its removal. There is always more or less danger in maintaining a large open area standing on pillars. Old workings that are not closed or sealed off should be ventilated thoroughly and examined every day. Where gas is found in any place, that place should be securely fenced off to prevent anyone from entering until the gas can be removed by competent persons after the men are withdrawn from the mine.

Another danger that is preventable with proper attention is the accumulation of dust and fine coal on the haulage roads and airways and at the working-face. In dusty mines it is particularly necessary that strict regulations should be enforced in regard to the loading out of all fine coal and dust. Men should not be permitted to stow this fine material in the waste, as it is liable to be thrown into the air by any violent concussion such as may be produced by a heavy or windy shot or a possible blownout shot. When suspended in the air, this fine dust is a menace to the safety of the entire mine. A further precaution to prevent the accumulation of dust on the roadways is to use dust-tight cars for the haulage of the coal, avoid overloading the cars and clean up the roads at regular short intervals.

I have mentioned but three of the more important preventable causes of mine explosions to which all practical mining men should give heed. If gas and coal dust can be taken care of at the working-face and on the roadways in mines by the enforcement of suitable mine regulations, many explosions will be prevented and lives saved.

J. Riley.

Sullivan, Ind.

Longwall in Pittsburgh Sea

Letter No. 8—I have been much interested in the question of mining the coal of the Pittsburgh seam by longwall. My attention was particularly drawn to Letter No. 7 by John Oldroyd, Coal Age, May 15, p. 859.

Mr. Oldroyd states that the only way to work the Pittsburgh seam on the longwall plan is to drive the entries to the property line and work the coal back on the retreating plan. In my opinion, this method would prove too expensive, as in many cases it would require perhaps two or three years for the entries to reach the property line and the work on the coal to commence. In regard to his statement that "No one who has had experience in the working of the Pittsburgh seam would attempt to mine the coal by the longwall advancing method, except possibly someone who has more money than brains," it may be said that there would naturally be more than one opinion on that point.

I want to present a plan that I have designed for working the Pittsburgh seam on the longwall advancing method. The plan possesses the advantage over the common longwall system in that there are no entries to be maintained through the gob, no packwalls to build, and no ripping or brushing of the roof is required. All the coal is mined by machine, and the entire operation, which I claim is feasible, is in compliance with the bituminous

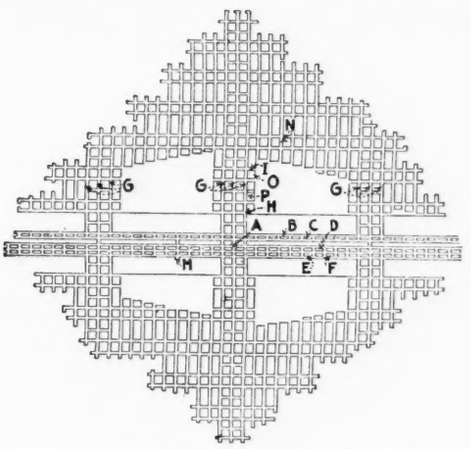


Fig. 1. General Plan of the Proposed Longwall Panel Work

mine law of Pennsylvania. The proposed method will yield cheaper and better coal and will prove less dangerous than the common longwall system. I shall be glad to answer any questions in reference to this plan, which may be described as follows:

The development of the mine is shown in Fig. 1, whicl. is not drawn to scale but is designed simply to show the

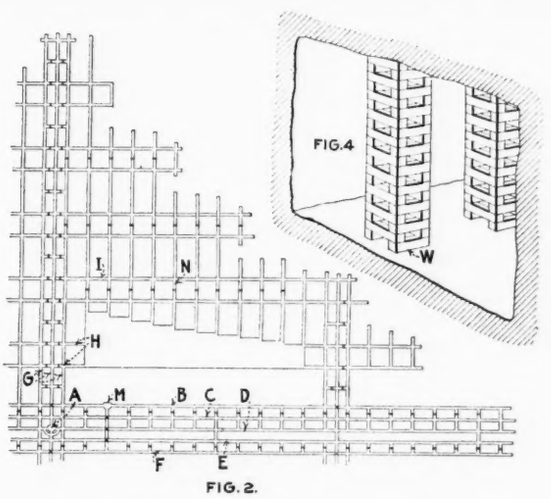


Fig. 2. Detail Plan of Single Section
Fig. 4. Method of Building Cribs

general arrangement of the main butt-entries and face-entries with respect to the longwall face in each panel. A detailed plan drawn to scale and showing one section of the mine is given in Fig. 2. The letters in each of these figures refer to the same items.

Two shafts were sunk from the surface to the coal. The hoisting shaft *A* is the downcast and the airshaft *M* the upcast for the entire mine. The mine is opened by driving five parallel entries on the butts of the coal. These are marked in the figure *B, C, D, E* and *F*. The middle entry *D* is the manway or traveling road, while the two entries *C* and *E* on either side of this are the haulage roads for each side of the mine. These three entries are all intake air-courses. The two outside entries *B* and *F* are the return airways for each side of the mine.

As shown in Fig. 2, face-entries *G* are now driven three abreast at right angles to the main butt-entries, the first set of face-entries being opposite the hoisting shaft. On each side of this first set of face-entries, other face-entries are driven three abreast, leaving a block of coal 1360 ft. wide between them. All entries are driven 10 ft. wide, the pillars on the main butt-entries being, say 10 yd. and those on the face-entries 8 yd. in thickness.

As shown further in Fig. 2, other butt-entries are then driven in pairs between each set of face-entries. The entries in each pair of butts are driven on 115-ft. centers, or with pillars 105 ft. thick between them. There is a block of coal 210 ft. wide between each pair of butts. Finally, face-entries are driven on 115-ft. centers off these butt-entries.

It will be seen that this plan divides the entire coal bed, as it is developed, into blocks of coal 105x105 ft., which form the pillars of each pair of butt-entries, while the coal between the consecutive pairs of butts is divided into blocks 105x210 ft. Fig. 2 shows about how much the entry work should be developed ahead of the working faces.

In Fig. 3 is shown in detail the method of drawing back the blocks of coal that form the working face in each

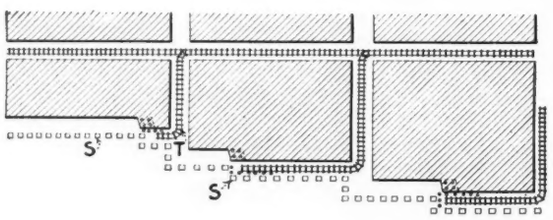


FIG. 3. SHOWING A SECTION OF WORKING-FACE IN ONE PANEL

panel lying between consecutive sets of the face-entries previously mentioned. As shown in Fig. 2, this work of drawing back the several blocks is commenced at the first butt-entry, or about 210 ft. from the main butt-entry *B*, at the point marked *H* on the plan. Each block of coal is undercut its entire width of 105 ft., by machine.

A clear distance of 7 ft. is maintained between the face and the cribs shown in the figure. This allows 5 ft. for track and 2 ft. of clearance to pass the cars and to set posts on the face side while working. It is important to keep each of these consecutive faces three cuts ahead of the face next following. The cribs are shown at *S*, while the track for hauling out the coal is shown at *T*. As indicated in the figure, the track is taken up and the cribs moved forward a distance of one cut as the work proceeds.

As shown in Fig. 4, the cribs are built of blocks of wood 2 ft. long and 6x6 in. in section. They are set 2 ft. apart, and in order to facilitate their removal as the work proceeds, only one block is placed at the bottom at *W*, the opposite ends of the next blocks above resting on a mound of slate or dirt. These cribs hold the roof in very good shape at the working face and prevent the falls from reaching the face of the coal.

From a casual glance at Figs. 1 and 2, it may appear that there is an enormous amount of narrow work on which yardage must be paid. I think I can show, however, that there is not as much narrow work in this panel longwall system as in the ordinary room-and-pillar system.

HARRY BROWN, Mine Foreman,
Hazel Mine.

Canonsburg, Penn.

Efficiency in Indiana Mining

In his letter entitled "Efficiency in American Mining," COAL AGE, May 8, p. 818, Samuel Dean contrasts the conditions existing in European mining with those in our own country in the following words:

> The lesson to be learned by these reflections is that if the European mine owner can have a magnificent mine building, palatial bathhouses and offices, garden villages and parked areas, and can still pay his workmen adequate compensation for injuries, extract all his coal, observe strict and burdensome laws in respect to the mining of the coal and yet show a low fatal-accident rate while paying 10 or 20 per cent. on his common stock—surely, that is "efficiency. . . . . If, as is true, numerous coal-mining companies here are tottering on the brink of bankruptcy owing to the ridiculously low selling prices of coal, the question that is of the first importance is, How are conditions exising here to be improved?

I will not attempt to answer this question, as I do not claim the ability to do so conclusively. I desire, however, to go on record as a "booster" for a movement that has been recently inaugurated in Indiana, which is a step in the right direction, if it does not *actually solve* the problem suggested in the above quotation. I refer to the action of Indiana coal operators in their proposed consolidation in respect to the sale of their coal.

An obvious answer to Mr. Dean's question is, Either increase the selling price of coal or reduce the expenses of operation and of marketing the product. Increasing the selling price of coal is a legitimate means of increasing profits *only* when such profits are reasonable, and the consumer always has a right to be shown that such increase is necessary. He cannot be required to pay for the mistakes made in producing the coal or the wasteful methods of mining.

Indiana coal operators have recognized these rights of the consumer, and in the present movement they aim to correct the wasteful methods of production rather than to increase the selling price of the product. This aim is clearly brought out in the statement made that under the system of a single selling agency such as is proposed, the present earnings can be increased fully 10c. per ton without adding to the selling price on the market.

A further answer to Mr. Dean's question would consider reducing expenses, either by cutting wages in the operating department or by eliminating unnecessary expenses in the sales department. But here also no attempt should be made by the operators to shift the burden to other shoulders. If it was expected, however, that a reduction in wages would effect the desired results the attempt would fail, since under the present system of unrestrained competition any reduction in wages would only be followed by a reduction in the selling price of the coal.

In this respect, the proposal of the Indiana operators should find general approval. They do not aim at a reduction in wages, but a consolidation of interests in the marketing of the product of their mines. The proposition will not add any burden to either the consumer or the wage earner, as it contemplates a reduction of unnecessary expenses in the sales department. It may involve standardizing the methods employed in the preparation of the coal in respect to sizing and cleaning it after it is taken from the mine.

A large saving can also be effected by eliminating some undesirable grades for which there is but a slight demand and which at the present time are thrown on the market at a loss in order to supply the demand for other grades. Another consideration would be the providing of storage facilities for those grades for which there is an unsteady demand. By thus storing and holding such grades for a more favorable market, a vast saving would be effected. In this manner, great opportunities are open for the conservation of the coal produced.

Incidentally, the proposed consolidation of interests will reduce the operating expenses as well. At present, operators are required to keep their plants in a state of preparedness to load coal on short notice. This results in a large expenditure with no corresponding income resulting therefrom. With a proper distribution of orders, each mine could be run more regularly for a definite period and then shut down with the knowledge that no sudden call would be made that would require constant preparedness.

The Indiana coal operators estimate that 200,000,000 tons of this nation's fuel supply is being wasted every year. The reason given for this is that present profits do not warrant the mining of coal that is not easily accessible and permits of a low expense of operation. The operators have no desire to violate the law or to form an illegal combine. They invite government investigation and government aid in forming the proposed consolidation, claiming that this would safeguard the interests of those indirectly affected.

Through their secretary, I. F. Callbreath, the operators presented a statement of the conditions that they are forced to meet, together with their suggested plan of cooperation, to the Federal Trade Commission, to the Department of Justice and to President Wilson. It goes without saying that a movement of this sort, brought about by legal means properly restricted to its avowed purpose and which does not infringe upon the rights of others, should receive the hearty support of all interested in good mining conditions.

GEO. N. LANTZ.

New Straitsville, Ohio.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

CHEMISTRY OF GASES

The chemistry of all matter treats of the interchange of the atoms constituting molecules, by virtue of which interchange the character and nature of the matter is wholly altered. In other words, the matter is transformed and a new substance created having properties that vary widely from those of the original substance.

Chemical Reaction—The change that takes place when matter is thus transformed is a **chemical change,** and the action is described as a "chemical reaction." It assumes an intimate contact between two unlike substances, under conditions that favor an interchange of atoms. The reaction that takes place is the direct result of the different affinities of the atoms for each other.

Chemical Affinity—The theory of chemical change supposes that all atoms constituting matter have various affinities or **degrees of attraction** for each other. By reason of this difference in the affinities of atoms, an interchange may or may not occur when two unlike substances are brought into intimate relation with each other, according as the atoms of the original substances possess a less or a greater affinity for each other in their present state or grouping. If the atoms of one of these substances possess a greater affinity for atoms of the other substance an interchange of atoms will take place and new substances will be formed that will be wholly different from the original substances.

Influence of Heat to Produce Chemical Change—The theory of heat assumes a wider separation of the particles of matter as the amount of heat in a substance is increased. Thus, it naturally follows that a higher temperature invites a more intimate mingling of two different gases in contact with each other. This intermingling of the gaseous molecules greatly assists the chemical reaction, which otherwise would not take place.

Examples of Chemical Change—The most common and familiar examples of chemical change are those due to the strong affinity of the oxygen of the air for most other matter. The resulting reaction is described as **oxidation.** The more familiar forms of oxidation are the rusting of iron and some other metals in a damp atmosphere. The action results in the "corrosion" or eating away of the metal and the formation of an oxide, which is quite different in its character and properties from the orginal metal.

Combustion—In a general sense, any form of oxidation is combustion, and the latter term does not relate alone to oxidation, but describes generally any chemical reaction in which one substance is consumed either slowly or rapidly by reason of the presence of another substance whose atoms possess an affinity for those of the first that invites reaction.

The substance consumed is termed the **combustible** and the other the **supporter of the combustion,** while the substances produced are the **products of the combustion.** The products of a combustion may be gaseous, vaporous or solid, the last named being the **ash** of an active combustion.

The Coal Age Pocket Book

Slow Combustion—This term implies a slow but continuous wasting away of the substance consumed, the conditions being unfavorable or the affinities of the atoms being insufficient to support a more rapid reaction. Slow combustion is characterized by the generation of **heat** without the production of **flame.**

Active or Rapid Combustion—Active combustion is generally accompanied by the production of flame. The same amount of heat is generated in less time, resulting in a higher temperature, which in turn frequently modifies the products of the combustion.

Spontaneous Combustion—Under certain favorable conditions, combustion may start in a mass of combustible material without the application of flame or other exciting cause. This is due to the natural **generation of heat** within the mass owing to chemical reaction taking place between the substances. The action is explained as being chiefly due to the **absorption of oxygen** from the air by the substance, when the ensuing oxidation generates sufficient heat to ignite both the gas produced by the combustion and the material. The combustion, which is at first slow, may, in time, develop actively and inflame and consume the material.

Chemical Symbols—A chemical symbol is a letter or letters used to designate an element or simple substance. The symbols of the more common elements together with their atomic or specific weights have been given in a table, previously. The symbol written alone expresses a single atom of the substance; but, since an atom is not conceived to exist alone, the symbol of an element should always be written as a molecule.

Symbol of a Molecule—A molecule is assumed to be the smallest chemical division of matter that can exist in a free state. A molecule of any simple or elementary substance is assumed to contain two atoms only. Its symbol is expressed by writing the symbol for that element with a subscript ($_2$) to indicate two atoms; thus for the molecule of carbon, write C_2; oxygen, O_2; etc.

The molecule of a compound substance may contain any number of atoms and is expressed by writing the symbols of its elements each with a subscript figure indicating the number of atoms of that element in the molecule. A single atom of an element is indicated by the symbol only, omitting the subscript figure.

The following examples will serve to illustrate the fact that, while a molecule of any simple substance is taken to contain two atoms only, the molecule of a compound may contain any number of atoms:

Substance	Composition		Symbol
Carbon monoxide,	carbon, 1 atom; oxygen, 1 atom;	= 2 atoms;	CO
Carbon dioxide,	carbon, 1 atom; oxygen, 2 atoms;	= 3 atoms;	CO_2
Ammonia,	nitrogen, 1 atom; hydrogen, 3 atoms;	= 4 atoms;	NH_3
Methane,	carbon, 1 atom; hydrogen, 4 atoms;	= 5 atoms;	CH_4
Olefiant gas,	carbon, 2 atoms; hydrogen, 4 atoms;	= 6 atoms;	C_2H_4

All these gaseous molecules are of equal size, though containing different numbers of atoms.

Inquiries of General Interest

Iron Pipe and Concrete for Mine Posts

If a 4-in. single-strength common wrought-iron pipe 6 ft. long is filled with concrete, will it carry a greater load when used as a mine prop than if the pipe had not been filled with concrete? Will a double-strength pipe filled in the same manner with concrete carry a greater load than the single-strength pipe? What I want to know particularly is whether filling the pipe with concrete increases its strength for use as a mine post.

CHARLES O'NEIL.

Tabasco, Colo.

This is a type known in concrete construction as "armored concrete." By filling the pipe with concrete its capacity for carrying the load is increased by an amount somewhat more than the compressive strength of the concrete, because of the increased rigidity of the column and its greater resistance to bending. The thickness of a standard 4-in. pipe is practically ¼ in.; that of an extra strong pipe, ⅓ in.; and that of a double-extra strong pipe, ⅔ in. These pipes used as columns 6 ft. long and with fixed flat ends are rated to carry loads of 19.7, 27.3 and 49.3 tons respectively.

A concrete composed of one part good hydraulic cement, three parts sharp sand and six parts clean broken stone, or a 1:3:6 concrete, after having set one month will have an ultimate compressive strength of 1800 lb. per sq.in. and may be assumed to have a safe compressive strength when incased in the pipe of, say, 800 lb. per sq.in. On this basis filling the three kinds of pipe mentioned with concrete will add respectively 5.1, 4.6 and 3.1 tons to the strength of the pipe because of the compressive strength of the concrete. The capacity of 4-in. concrete-filled iron posts 6 ft. in length, for standard pipe, extra strong and double-extra strong, may therefore be estimated as, say, 25, 32 and 52 tons respectively. These pipes filled with concrete will weigh 23.5, 26.8 and 38.3 lb. per ft.

While such posts possess extraordinary strength as compared with wooden props, for use in mines, they undoubtedly possess the disadvantage of being very heavy and difficult to set in position, but especially difficult to remove when they have once taken the weight of the roof. The handling of such props from the surface to the working face in the mine would also prove a considerable item of expense.

How to Find a Ground in an Armature Coil

Kindly explain the proper course to pursue to find a ground in the armature of a dynamo that gives a shock. At our plant we have no instruments for this purpose, and I would like to ask if a current can be sent through the machine by connecting one terminal to the shaft and rotating the other terminal about the commutator for the purpose of detecting the ground. If this can be done, kindly explain the method.

MINE ENGINEER.

Des Moines, Iowa.

The proper way to detect a ground in the armature of a dynamo is by the use of a millivoltmeter. Not having this instrument, it is possible for an experienced operator to detect the trouble by the use of a small lamp instead of the voltmeter. In any case, the testing current must be one of low voltage, being regulated by several lamps introduced into the circuit until the desired result is obtained. When the voltmeter is used, the voltage of the testing current should be sufficient to give an ample deflection of the needle, say about half across the scale.

Assuming that the motor has been disconnected from the supply line and a low-voltage testing circuit provided, connect this circuit with the armature terminals, so that the current will pass through all the armature coils. The current should be sufficient to enable a satisfactory reading to be taken on the millivoltmeter or galvanometer, which is the most reliable means for locating the trouble in the armature.

Now, ground one of the leads of the millivoltmeter on the armature shaft and proceed with the other lead to explore from bar to bar, passing completely around the commutator. The two bars that give the least deflection of the needle of the voltmeter indicate the approximate location of the trouble and reveal the grounded coil.

In a parallel-wound armature these bars will be adjacent to each other, while in a series-wound armature they will be separated by two pole bases. The ground so indicated, however, may exist in the commutator segment instead of in the coil, and it is therefore necessary to make a further test to determine its exact location.

In order to do this, disconnect the two leads of the coil in question and proceed to test the coil alone. If the trouble exists in the coil, this test will show the same reading as before.

Mining Engineer Eligible

Kindly advise whether a mining engineer, 23 yr. of age and with 7 yr. experience as such in the bituminous mines of Pennsylvania, is eligible to receive a certificate to act as fireboss on passing the required examination.

MINING ENGINEER.

Avella, Penn.

The bituminous-mine law of Pennsylvania (1911) requires applicants for a fireboss certificate to "have had at least 5 yr. practical experience, after 16 yr. of age, as miners or men of general work and . . . experience in mines in Pennsylvania that generate explosive gas." A mining engineer is eligible under the bituminous law to take the examination and receive a mine foreman's certificate, but he is not eligible for the fireboss certificate.

Examination Questions

Pennsylvania Anthracite Mine Foreman's Examination Held at Scranton, May 18-20, 1915

(*Selected Questions*)

Ques.—What are the three greatest causes of accidents in anthracite mines? Give percentages of each, and state how you would reduce these accidents.

Ans.—The three causes producing the greatest number of accidents in anthracite mines are: 1. Falls of coal and roof. 2. Movement of cars in the mines. 3. Explosions of blasts.

The percentage of accidents from these causes may be generally stated as follows: Falls of coal and roof, 45 to 50 per cent. of all accidents underground due to any cause; accidents due to the movement of cars in mines, 15 to 18 per cent.; accidents due to explosions of blasts in mines, 10 to 12 per cent.

In order to reduce the number of accidents due to falls of coal and roof, every working-place should be inspected at least twice a day while the men are at work. An assistant foreman should be placed in charge of each district of the mine and should see that every working-place is properly secured by props or timber and all loose coal or rock pulled down or made secure. Allow no one to work in a place that is unsafe unless for the purpose of making it secure, as required in General Rule No. 12 of the anthracite mine law. The mine foreman or his assistant should see that every miner has a sufficient number of good cap-pieces of suitable length, width and thickness, as well as timbers of the required size for use in his place. He should see that the miner remains at work in his place with his laborer whenever danger is suspected and always in pillar work. The mine foreman and each of his assistants should enter a daily report signed with ink in a book kept for that purpose, and the mine foreman should read the daily reports of each of his assistants.

In order to reduce the number of accidents due to the movement of mine cars, all gangways and main haulage roads should have a clear space of 2½ ft. between the top rail of the car and the ribs or timbers. This clearance should be maintained throughout the entry on the same side of the road as far as practicable and kept free from obstructions of any kind. Where such clearance cannot be provided, refuge holes should be made in the ribs. These should be of ample size and, as far as practicable, on the same side of the roadway not more than 100 ft. apart and whitewashed and kept free from all obstructions. A similar clearance of not less than 2 ft. should be maintained on roads, in all breasts and kept free from obstructions, such as frequently block the roads in rooms, as timbers, rails, tools, etc. The height of gangways and traveling ways should not be less than 5 ft. 6 in. in the clear. No person under the age of 17 shall be employed as triprunner or driver, and no person except the driver shall ride on the front end of a car, where a seat should be provided if required for safety. No person shall ride between the cars and no driver shall stand on the tailchain when driving. Where persons are lowered or hoisted in slopes, special cars should be provided for that purpose. Platforms if used should not extend over the top rail of cars, and chutes must not extend more than 12 in. over the top rail, except when the chutes are at least 16 in. above the rail. All platforms and chutes extending over the top rail of the cars must be removed when a breast is finished or abandoned.

In order to reduce the number of accidents by blasts, wherever practicable, an electric battery should be provided for firing the blast. Such batteries must be approved by the mine foreman, who shall give the miners all needed instructions for their use. Only one kind of explosive shall be used in the same hole, and all holes shall be tamped to the mouth with clay or other incombustible material. No charge of high explosive that has misfired shall be withdrawn, nor shall any attempt be made to open the hole.

Ques.—What air is traveling through a gangway 12 ft. wide and 7½ ft. high when the anemometer registers 472 ft. per min.?

Ans.—The sectional area of this airway is $12 \times 7\frac{1}{2} = 90$ sq.ft. Without making any allowance for the inertia of the anemometer, the volume of air passing in this gangway is $90 \times 472 = 42{,}480$ cu.ft. per min.

Ques.—An airway is 5 ft. wide at the top, 10 ft. wide at the bottom and 6 ft. high. If the anemometer reads 280 ft., what is the quantity of air passing?

Ans.—The average width of this airway is $\frac{1}{2}(5 + 10) = 7.5$ ft., and its sectional area is $6 \times 7\frac{1}{2} = 45$ sq.ft. The volume of air in circulation in the airway is therefore $280 \times 45 = 12{,}600$ cu.ft. per min.

Ques.—How would you proceed to remove a body of firedamp from the face of a chamber 40 ft. wide, in a vein 2 ft. high?

Ans.—Assuming that this chamber is filled with an accumulation of firedamp or a mixture of marsh gas and air in explosive proportions and that the vein is pitching, the first step is to notify and remove all the men working on the return air in this section of the mine. It may be even advisable to withdraw all the men from the mine before attempting the removal of the gas. The method of procedure will depend upon the condition of the chamber, but in any case the intake air must be conducted into the chamber and made to sweep the face of the breast. This can be done by erecting a temporary canvas brattice, starting from the mouth of the chamber on the intake side. The brattice should be extended up the pitch gradually, so as to give time for the complete removal of the gas as the work proceeds. Only safety lamps should be used, and these must be protected against a possible fall of roof that would cause an outrush of gas from the chamber. In so thin a vein, it may be better to employ a small "booster" fan and a collapsible canvas air tube for conducting the air to the face of the chamber, assuming these are available. It is important to employ an air current sufficiently strong for the removal of the gas.

Coal and Coke News

Harrisburg, Penn.

A résumé of the work of the Legislature, which adjourned on May 20, insofar as the coal interests of the state are concerned, shows that the mining industry occupied a prominent position during most of the session.

The most important bill affecting the anthracite region was the Catlin bill to bring the anthracite miners under the operation of the workmen's compensation act. This bill was reported from the conference committee on May 20, the only change being made by this committee, was to make it effective Jan. 1, 1916. The Governor has stated that he will sign this measure.

The bill next in importance to the anthracite region is the Dawson tonnage tax measure. This differs from the Roney bill of two years ago in that the money is to be apportioned among the particular municipalities in which the coal is mined, rather than among all the counties, boroughs and townships in the anthracite counties regardless of whether or not they have mineral resources. The governor made a desperate effort to take the major portion of the tax for the use of the state, but the bill finally passed on a 50-50 basis. The measure levies a tax of 2½ per cent. ad valorem on all anthracite coal mined, and provides that one per cent. of the tax shall be paid to the superintendent of the mine for making the return. The Governor was much pleased with the passage of this measure.

A bill passed meaning much to the anthracite miners was the Beidleman measure to create 21 assistant mine inspectors. Anyone working inside of any anthracite mine will be eligible for election; the duties of this office will be to look after the ventilation. Each assistant inspector will receive a salary of $2000 per annum. The Governor now has this measure on his desk.

The Powell bill providing for four new anthracite inspectors is also in the Governor's hands. Three are to be elected in Luzerne and one in Lackawanna County.

The bill to increase the pay of the mine inspectors' examining boards in the anthracite region from $6 to $10 per day is in the Governor's hands.

The joint resolution introduced by Senator Vare to appoint a commission to investigate the increase in prices of anthracite alleged to be in excess of the anthracite tax passed both houses, but the amount appropriated to cover the expense of this commission was cut from $10,000 to $5000.

The Senate bill amending section 1 of article 4, section 1 of article 5 and section 9 of article 24 of the act of June 9 1911, permitting operators, managers and superintendents free selection of mine foremen, assistant mine foremen and fire bosses and placing mine employees under the supervision and control of the operators so as to bring all bituminous workmen under the Compensation Act has passed both houses and the Governor has assured the mine workers that he will sign this measure.

A bill of great importance to mine inspectors of the bituminous region providing that mine inspectors who have served for 8 years and have passed two examinations shall be exempt from any further examinations, needs only the Governor's signature to become a law.

The Crow bill amending rule 18 has already become a statute.

The McClure bill providing that where clay mines are worked with bituminous coal mines they shall come under the supervision of the bituminous mine inspectors has passed both houses.

The veto of the Horton bill regarding safety devices for trips in slope mines is said to be a disappointment to several operators who have been using a system of broken switches. These operators have been required, in addition to their system of derails, to use the customary sprag in the rear car of the trip. Under this system the man in control of the trip closes the switches when the empties are being lowered into the mine. They are opened for a loaded trip, the theory being that should the rope break, the trip would be derailed upon reaching the first switch. Many operators, it is said, hoped through the Horton bill to be relieved from the necessity of using any other safety device.

Two big constructive measures enacted into law were the Child Labor and the Workmen's Compensation acts. The Governor did not stop with giving the child workers between 14 and 16 years of age a 9-hr. day and a 51-hr. week with 8 hr. of that time for school, but had incorporated in the general appropriation bill an appropriation of $1,000,000 for vocational schools.

The opposition to the Workmen's Compensation bill was not so bitter as that toward child labor, but the Governor succeeded in winning his points, in that the act will go into force Jan. 1, 1916, and not in July, 1916, as was intended by the enemies of the bill, who seemed to let up in their fight during the last days of the session. The six bills are in practically the same shape as drawn by the Attorney General, with the exception of a few minor changes, as to appointive power being placed with the Governor and not with the Commissioner of Labor. There are also a few slight changes in the Insurance bill.

A number of bills, among them being the appropriation of $200,000 to the U. S. Bureau of Mines for the coöperation of that bureau with the Department of Mines in the establishment of an experiment station; the appointing of two assistant chiefs in the Department of Mines; the right of committees of mine workers to inspect bituminous coal mines; filing of maps with adjoining property owners of bituminous coal mines; providing for a new state board of examiners of anthracite mine inspectors; and giving power to sealers of weights and measures to examine and seal scales at coal mines, all passed the House, but never saw the light of day when they reached the Senate. All other mining bills were killed in Committee.

It was apparent that a desperate effort was being made to put through a bill which provided that all portable electric lamps used in bituminous mines should be tested by the U. S. Bureau of Mines, one being introduced in the House and another in the Senate, but each time there was such a strong protest against this that they were sent to the scrap heap.

PENNSYLVANIA

Anthracite

Shamokin—Five hundred employees of the Luke Fidler colliery of the Susquehanna Coal Co. were rendered idle on May 19, when the United Mine Workers threw down their tools, declaring they would not work with men who refused to become members of the United Mine Workers of America. Between 25 and 30 miners were without cards entitling them to work as union employees.

The colliery of the Buck Ridge Coal Mining Co. will be closed down for three months. The reasons for this suspension are certain repairs are to be made to the colliery and the present dull condition of the anthracite business, particularly for red ash anthracite coal. It is contemplated that no shipments will be made from the colliery during the above-mentioned period, but this will be governed somewhat by the conditions of the coal market. In the meanwhile, however, work will be done at the colliery for the development of other veins of coal on this property. A recent report made by one of the most prominent anthracite engineers places the recoverable coal still in the ground at Buck Ridge at an amount exceeding 15 million tons.

Ashley—The large planes of the Central R.R. of New Jersey were temporarily shut down recently because one of the big hoisting engines broke down. Ten locomotives and crews from Mauch Chunk are assisting in getting the coal over the planes to the weigh station on the top of the mountain.

Plymouth—Refused the concession of working 8¾ hr. for a 9-hr. day the driver and breaker boys at Buttonwood No. 23 colliery operated by the Lehigh & Wilkes-Barre Coal Co. went out on strike on May 21 tying up collieries Nos. 21 and 23, employing about 1000 men. This was the fifth strike within a week at this company's collieries. The strikers wanted the 15 minutes off each day in order that they might be prepared to leave the mine and breaker the minute nine hours were up.

Hazleton—The Lattimer No. 4 breaker of Pardee Brothers & Co., Inc., one of the largest and best equipped in the Lehigh coal field, was destroyed by fire of unknown origin May 25. The loss is $75,000, partially covered by insurance. Five hundred hands are thrown out of work.

Harrisburg—There is a prospect that the final decision in the anthracite coal tax appeals will not be rendered for two and a half years. The appeals taken by the 100 or more coal companies interested from the settlements made by the Auditor General under the act of 1913, and involving $6,000,000 or more now in the hands of the companies, are now before the State Supreme Court sitting here at the Capitol. However, a petition will be presented asking that the case go over for argument at the October term of the court at Pittsburgh.

Wilkes-Barre—Declaring that if coal is being mined at the rate for which reductions have been made in the value of coal lands during the last three years the supply will be exhausted within 12 years, the school board of Foster township has demanded from the County Commissioners a fair and equitable valuation, so that when the coal supply is exhausted the coal companies will have paid their fair share of the tax burden. The valuation of coal lands in Foster township has been decreased $253,661 this year.

Scranton—Good Roads Day received a big boost when orders were issued by the Lackawanna and Scranton Coal companies closing down all of their collieries May 26 so that their employees might have a day to devote to the good roads movement. The Lackawanna company's action means that 22,000 men in Luzerne and Lackawanna Counties will be at liberty to handle a pick and shovel on the roads, while the Scranton Coal Co.'s 8000 employees will also find work on the roads.

Bituminous

Uniontown—Receivers of Josiah V. Thompson on May 24 closed a deal with the executors of the estate of W. J. Rainey, deceased, for the sale of 76 acres of coal land in Fayette County. The price given out is $2000 per acre. The tract is known as the Johnson farm and adjoins the Revere plant of the Raineys. This is the first sale of coal in Fayette County of any importance in years.

Activity still continues to make itself felt in this section. The Frick company has ordered more ovens to be fired. Some of these were put in at Grindstone while others are distributed among the different works. Grindstone is at present operating 245 ovens out of a total of 300. Orders from Scottdale are looked for almost daily that will cause the plant to resume in full.

Ferndale—Eight men were killed in an explosion late on Monday afternoon (May 24) in the Valley No. 1 mine of the Smokeless Coal Co. and another lost his life in attempting their rescue, the latter being Gomer Phillips, chief of the first-aid work of the mining department of the Cambria Steel Co. After he entered the mine at the head of the rescue corps of his company, Phillips, it is thought, became confused and pulled off his helmet. He was overcome by the gases and died at the hospital several hours later.

The dead were not taken from the mine for many hours after the explosion. They were all Americans. The mine did not work on Monday, but the men were allowed to enter to load cars, it is said, in order that they might earn a little extra money.

News of the accident was at once telephoned to the Cambria Steel Co. at Johnstown, and a mine rescue corps was immediately rushed to the Valley mine. The rescue team was equipped with oxygen helmets and other apparatus. The rescuers penetrated the workings some distance in spite of the fallen roof and broken timbers and partitions, but found no sign of life. Some of the bodies of the men who had been at work at the time of the explosion were located, but were not removed for some time, for the efforts of the rescuers had to be directed chiefly to saving their own comrades who were overcome.

Superintendent C. H. Crocker of the Cambria company was one of the victims. He was brought to the surface by General Manager H. J. Meehan of the steel company who volunteered to enter the mine without a helmet. Gomer Phillips, John Broderick, John Frear and W. M. Dyer, members of the Cambria crew, were all overcome and taken to the hospital. All were resuscitated with the exception of Phillips.

It is believed that the explosion was due to gas, which accumulated in the right heading of slope No. 2 of Valley No. 1 mine. This slope is located about 2000 ft. from the main entrance.

All must have died almost instantly, as the bodies first encountered showed, but little evidence of the victims having struggled to make their way toward safety. For a time there was no certainty as to the number of victims, it being believed that some of the men at work might have made their way out by an entry leading into another working of the same company.

Greensburg—Complaint has been made by the Pittsburgh & Ohio Coal Mining Co., and the Jamison Coal & Coke Co., with the Interstate Commerce Commission against the Baltimore & Ohio R.R. Co. It is charged by the complainants that the charge of $1 for demurrage on cars at Cleveland, Lorain and Sandusky, during April and October, is unjust and unfair. The statement is made that lake travel is often held up those two months and it is impossible for that reason for cars to be loaded on lake steamers promptly.

Bentleyville—Seven hundred safety lamps were destroyed in the recent fire at the lamp house of the Acme Mine No. 2 of the Westmoreland Coal Co. The damage amounted to about $2000.

Pittsburgh—Heavy shipments of coal and other freight are being made by water from Pittsburgh to lower river points. A total of 160,550 tons of freight left the harbor on May 23, among which were some heavy shipments of steel products.

The miners of the Pittsburgh district are at last enjoying a period of some prosperity. According to recent estimates, about 37,000 coal miners are now employed in this district. While all of these are not working full time, they are at least all making a living. It is anticipated that coal shipments will shortly be made to practically capacity. Should coal operations become much heavier a shortage of men will be experienced.

WEST VIRGINIA

Martinsburg—The last payday at the various mines near Lonaconing was the largest for a long time. It is reported that the Consolidation Coal Co. alone distributed upward of $87,000. This is said to have been the largest pay, save one, that this company has distributed under its present management.

Welch—E. T. Wolfe, night foreman of the Carter Coal Co., at Coalwood, was recently fined $52 and costs for alleged violation of section No. 13 of the mining law. The charge was that the mine fan had been shut down from 5 p.m. to 7:45 p.m., and that Wolfe had sent men into the shaft before he examined the mine. Also that he failed to have a signal at the head of the shaft, according to the mining law.

Charleston—There has been a perceptible increase in the coal business in this section of the state recently. Many of the mines along the route of the Kanawha & Michigan R.R., between Charleston and Gauley Bridge, on both the north and south sides of the Kanawha River, have increased their tonnage to meet the demands of consumers, and it is expected that conditions will continue to improve throughout the summer. The mines at Boomer, Longacre, Carbondale, and other places, are now working full time, and have taken back all their old employees who were laid off last fall.

ALABAMA

Birmingham—There will be a Field Day demonstration held at Birmingham under the auspices of the Alabama Safety Association on May 29, and 78 first-aid teams have entered for the event. Three silver loving cups are to be presented respectively to the best team of white men, the best team of white women, and the best team of colored men. The American Mine Safety Association will meet in Birmingham in October. First aid teams from all parts of the country will attend that meeting also.

In the case of the Tennessee Coal & Iron Co. vs. C. B. Smith, state auditor, the Supreme Court has handed down a decision whereby the Tennessee company recovers $18,000 from the state which was collected for license fees under the statute which was recently declared unconstitutional.

KENTUCKY

Whitesburg—There is the greatest activity in the mines in the Letcher County field and three to four hundred miners have been put to work in the last week or so. The amount of coal going out of this district at present is the greatest in the history of the field. Full time operations are to be the rule shortly.

Owensboro—The Fern Hills Coal Co.'s property, equipment and tipple have been sold for $16,800 by Master Commissioner Clements to T. A. Pedley, receiver. The property included 600 acres of land, with all the coal and mineral rights and the total had been appraised at $25,000. Indiana coal dealers were opposing bidders.

Henderson—The Deep Water Coal & Coke Co. will close the big deal for thousands of acres of western Kentucky coal lands in July, according to a statement attributed to H. F. Allen, president of the company. It had been reported

previously that the war in Europe was delaying consummation of the deal.

Lothair—The Ashless Coal Corporation has increased its coal shipments from 2000 to 3000 tons daily since the improvement of the markets of the Great Lake region. A good increase has also been made in the working force.

Benham—The Wisconsin Steel Co. is now shipping more coal than at any time in the history of the plant. It also proposes some increases during the summer months. Three hundred extra miners have gone to work during the past 10 days.

OHIO

Cincinnati—The contract for the sale of the Marmet Coal Co.'s properties to an Eastern syndicate has been presented to the superior court and approved. The approval of the court was made subject to a part payment of 20 per cent. of the purchase price of $1,500,000, failing which public sale of the property will be had. It is reported that the syndicate intends the Marmet properties as a nucleus for large operations, from which coal for the Northwestern markets will be taken. The company's bonds to the amount of $563,500 are to be sold June 8, 1915, by Irwin, Ballmann & Co., of Cincinnati, being covered by a mortgage on all of the company's property, which is presumably to be conveyed to the purchasing syndicate subject to this incumbrance.

INDIANA

Terre Haute—The coal mining properties of the J. K. Dering Coal Co., of Chicago, situated in Sullivan, Vigo, and Vermillion Counties were recently sold at auction to the Continental Commercial Bank of Chicago, for $400,000, following a decree of foreclosure on petition of the bondholders.

Sullivan—The heirs of John L. Woodbridge have filed suit against the Vandalia Coal Co., demanding $20,000 royalty. They allege that their father's farm was leased in 1898 to the Island Valley Coal Co. for 25 years the lessee or his assigns to pay 5c. for each ton that would pass a 1½-in. screen. The Island Valley Co. sold its lease in 1905 to the defendant company which, it is alleged, has mined 400,000 tons of coal on which it has paid no royalty.

ILLINOIS

Pana—Mine No. 1 of the Pana Coal Co. was recently sold by Special Master in Chancery Jas. L. Drennan to Leslie L. Taylor, of Taylorville, at public auction for $30,000. The sale includes all mineral rights amounting to more than 1000 acres of underlying coal, all machinery, together with several tracts of city property.

Belleville—Damage suits aggregating $33,000 have been instituted in the Circuit Court against the Franklin Coal & Coke Co., as the result of the mine accident at Royalton, Ill., Oct. 27, 1914, in which 29 miners lost their lives.

Cuba—Star Mine No. 3 recently hoisted 866 tons of coal in one day, which is the best record ever made at this mine.

IOWA

Albia—A coal deal was recently closed, by which the Smoky Hollow Coal Co. has come into possession of No. 7 Hiteman Mine, which was started a few years ago. This is said to be one of the best mines in Cedar Township.

FOREIGN NEWS

Vancouver, B. C.—Internment of alien enemies on a wholesale scale was begun May 25 in the coal mining district of Vancouver Island. By noon 115 Austrians and Germans in the Southfield, Cumberland and Nanaimo mines had been placed on a special train bound for the internment camps. The alien enemies were taken into the mines a year ago as strikebreakers when the coal pits were tied up by the Western Federation strike. The former workmen are now to resume their jobs.

PERSONALS

John R. Hoffman, oldest mining engineer of the Philadelphia & Reading Coal & Iron Co., has retired because of age.

James Reese has been made general superintendent of the mining operations of the Maderia Hill Coal Mining Co., in the Mahanoy Valley.

C. N. Blanchard, of Binghamton, N. Y., head of Blanchard & Co., which owns the anthracite mine at Archbald, Penn., has retired from the company and will give his whole time to the Seiler-Blanchard Co., of which he is treasurer.

J. S. Roughgarden, for some time Buffalo representative of Whitney & Kemmerer, has resigned. His successor is F. W. Buckalew, who has been traveling salesman from the Buffalo office of the firm.

Edwin Maurer, formerly superintendent of the Lehigh Coal & Navigation Co.'s shops, at Lansford, Penn., was the victim of an accident recently when he was struck by a bicycle, and thrown to the ground. Although seriously injured, Mr. Maurer is expected to recover.

Lloyd G. McCrum, formerly of the McCrum-Howell Co., has just been made general manager of mines for W. H. Bradford & Co. Inc., of Somerset, Penn. Offices have been opened in New York, Philadelphia and Somerset. The plants of the new corporation are all located near Somerset, Penn.

Reese Tasker, general mining superintendent of the Philadelphia & Reading Coal & Iron Co., suffered a stroke of paralysis recently and his condition continues to be critical. Mr. Tasker has been prominent in mining affairs for nearly half a century and has been one of the leading officials of the Reading coal company for 25 years.

Philip N. Case, sales engineer for the Hyatt Roller Bearing Co., will in the future be in charge of all mine car applications, traveling in the western part of Pennsylvania, Ohio and West Virginia. Mr. Gleisen who formerly covered this territory will travel in the eastern part of Pennsylvania, New York and New Jersey.

Thomas I. Scott and G. H. Hodges, superintendents respectively of the Wynn and Kyle plants of the H. C. Frick Coke Co., have been transferred to the engineering department at the Scottdale offices of the company of which both men are graduates. For the present P. J. Locke of the Leith plant will have supervision over Crossland works; Superintendent English, of Oliphant, will have charge of the Wynn plant, and Superintendent Beerbower, of York Run, will look after the Kyle plant.

INDUSTRIAL NEWS

Williamson, W. Va.—The Williamson Coal Co. is advertising for coal miners.

New York, N. Y.—The Bulah Coal Mining Co. is now occupying its new offices in the Equitable Bldg. at 120 Broadway, New York.

Bluefield, W. Va.—The shipments of coal over the Norfolk & Western Ry. for the month of April 1915 amounted to 1,683,958 tons; of this the Pocahontas District furnished 1,069,684 tons; Tug River 285,243 tons; Thacker 216,955 and Kenova District 112,076 tons. The coke tonnage for the month was 61,075 tons.

Huntington, W. Va.—The City Employment Bureau recently received a letter asking for 500 men for work in the Consolidation Coal Co. mines in the vicinity of Jenkins, Ky. A number of men have already been sent to this field, but the majority of those applying for work at the Municipal agencies want jobs within the city.

Uniontown, Penn.—Judge Ruppel of Somerset County has handed down an opinion dismissing the suit brought against Archibald Miller, superintendent of the Loyalhanna Coal & Coke Co. operating at Cairnbrook, by Fish Warden Raymond O. McIntosh, of Johnstown, in which the defendant was charged with polluting the waters of Dark Shade Creek with sulphurous mine drainage.

Somerset, Penn.—The mining interests of W. H. Bradford, the Phœnix Fuel Co. and the Victor Coal Mining Co. have consolidated their operating and selling departments under the corporate name of W. H. Bradford & Co. The mines are located in Somerset County, with operating headquarters in Somerset. The main offices of the company will be in the Commercial Trust Building, Philadelphia.

Huntington, W. Va.—It is reported that the Pocahontas Fuel Co. is now building a fleet of colliers which will be entered in the coastwise and foreign trade, principally that with South America. The Clinchfield Collier Co. is also said to be making plans for the construction of two steel colliers which will be put in the foreign trade immediately on completion. The construction of these fleets will mean much to West Virginia in that they will be the means of transporting fuel to a market which hitherto has been touched by few of the coal interests of this state.

Coal Trade Reviews

General Review

Anthracite reported on demurrage and a dull season is anticipated. Heavy export demand for bituminous stimulates interest among local consumers. Lake movement increasing.

The rigid restriction of output at the anthracite collieries has failed as yet to relieve the pressure on the market. The Lake movement is the only branch on anything approaching a normal basis and it is becoming steadily more evident that the trade is in for an abnormally dull season. There are already reports coming in of coal on demurrage going at sacrifice prices.

The constantly expanding export business continues the leading feature in an otherwise dull bituminous market. The activity in this branch is stimulating some interest among buyers in this country and has already resulted in some relatively small contracts being closed, while requisitions on other contracts are slightly heavier due probably to a disposition to accumulate some stocks. On the other hand the market is undoubtedly slow responding to the reported improvement in general industrial conditions. The failure of the West and Northwest to figure more prominently in the spring business is a particularly discouraging feature of the situation. Some of the higher grade fuels which have been diverted entirely into the export business, have recently appeared again in the local markets.

The settlement of the Ohio labor difficulties is viewed with much concern in the Pittsburgh district where competition with outside districts has already brought the market to a more or less complete standstill. The buying is so slow that shrewd consumers have no trouble in filling their current requirements with cheap coal threatened with demurrage. Even the abnormally low circular figure on Lake coal is being substantially shaded. Requisitions from Canada continue at a low ebb while railroad buying is less than a few months ago, and it is generally evident that the reported improvement in industrial conditions has failed entirely to spread to the coal industry.

There has been considerable buying of a temporary character in various directions including fuel for threshing purposes, which is once more a factor in trade circles for a short period at least. Contracting continues slow because of the cheap coal being offered, and concessions on last year's figures are still obtainable. While the Lake movement is still considerably below normal, there is quite a volume of coal moving in that direction, which is creating a somewhat better feeling in trade circles.

The collapse of the selling organization which was attempting to maintain prices in the St. Louis district was a discouraging development in the Middle West during the week. The market is generadlly flat in all directions, with the exception of screenings, the entire output of which is being absorbed on contracts and none is available in the prompt market. Some uncertainties are developing regarding the labor situation in the Middle West.

BUSINESS OPINIONS

Money still accumulating but business is marking time pending receipt of the German note. Steel industry improving in certain branches.

Boston News Bureau—So far as the financial side of the situation is concerned it is purely a waiting proposition, waiting for the German answer to the American note. Our foreign commerce continues surprisingly large, that is our exports, which means, of course, that an enormous trade balance is running in our favor. Money still accumulates and is bound to increase in volume so long as Europe increases our supplies rather than decreases them. The security market is quiet and naturally sensitive. It is good belief, however, that prices would advance more sensationally if the German reply were even fairly satisfactory than they would decline in case the reply was distinctly disappointing.

Iron and Steel—Contracts for rolling stock by the railroads and foreign governments are the chief feature of interest. More orders for cars have been placed in May than in the entire period between Jan. 1 and Apr. 30, and it looks as though there will be a great deal of business in this line. Moreover, railways have been buying fabricated steel for bridges, and the amount of steel required in car building is probably 5% of the capacity of the steel mills. The pig-iron market has been dull. Some sales of 10,000-ton lots have been made to the pipe founders on the Delaware River, but in general very little iron has moved. The jobbing foundries have purchased a little more freely, particularly those in the Connecticut Valley, probably because there is a demand for machinery castings.

Dun's—The uncertainty regarding the European situation, and the broadening scope of the war, have occasioned some hesitation in general business. The effect of this, however, while adding to the underlying conservatism, has not materially changed the recent trend toward normal conditions in the principal industries and trades. The improvement has held its own, and as the special advices received this week from ninety leading cities clearly show, there is a slow but steady expansion in business.

Bradstreet's—While trade and industrial conditions continue to move along generally favorable lines, the week's developments disclose some irregularity. On the one hand, wet or cool weather has checked distributive trade, and especially retail business, and at the same time unsettled international political matters tend to cause wholesale buyers in some lines to go slow, while the same factor holds up certain speculative projects. But, on the other hand, industry is more active, employment is increasing, and war orders continue to cause extraordinary speed at a number of centers.

Marshall Field & Co.—Current shipments of dry goods total about the same as during the corresponding week a year ago. Sales by our traveling organization show an increase over those of the same week last year. The volume of business that is being booked for fall delivery continues to show a gain. Collections are very satisfactory.

ATLANTIC SEABOARD

More talk of firmer prices due to activity in export market. A few additional contracts closed in New England territory. Georges Creek again available for spot delivery. Pennsylvania grades unchanged. Anthracite coming forward slowly and May orders likely to carry over into June.

Bituminous—A few small contracts closed this week have lent color to the increasing talk of firmer prices. The export business is conceded to be in such good shape that some of the buyers, who hitherto have consistently postponed making season purchases, have now already closed, and others are considering doing so in the near future. As a result $2.80 is nearer the figure f.o.b. Hampton Roads than the $2.65 of a month ago, but at the same time there has been no impetus to the trade. It is only because of extremely dull local conditions that the relatively unimportant contracts placed early in the week have been noticed at all. They are significant, however, as showing the trend of the market.

Delivered prices show no material stiffening. At the distributing points there are fewer cargoes being forced on the trade, but the price range depends mainly on the pressure to sell on the part of the various shippers. Some cargoes have waited an undue season and demurrage charges must be heavy.

Georges Creek is beginning to come to Philadelphia and New York, now that foreign tonnage is being cleared more promptly from the Baltimore terminals. This grade has been practically out of the market for spot shipment a month or more, long enough to create a temporary demand for small lots. There will probably be some movement now from Philadelphia in the next 30 days or so.

In the Pennsylvania grades the market continues heavy. Prices reached a low point some weeks ago and there has been no change worth noting. The quality grades are heard from all over the market, but there will hardly be any im-

provement in demand until Pocahontas and New River are well established on the $2.85 basis.

Water Freights are unchanged. The supply of barge and steamer tonnage is ample for coastwise needs. Sailing vessels continue to charter off-shore as fast as they become available.

Anthracite—Shipments are being made rather more slowly this month than was anticipated. Apparently the curtailment at the mines is having effect and with the companies who do most of the business in this territory there is prospect now that orders will drag over into June. Less is heard here of prices under the circular. Some of the individual shippers are behind on their orders.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$0.85@1.40	$1.20@1.60	$1.67@1.77	
Philadelphia*	2.10@2.65	2.45@2.85	2.92@3.02	
New York*	2.40@2.95	2.75@3.15	3.22@3.32	
Baltimore*	.....	.....	2.85@2.95	
Hampton Roads*	.....	.....	.....	$2.75@2.85
Boston†	.....	.....	.....	3.60@3.78
Providence†	.....	.....	.....	3.55@3.73

* F.o.b. †On cars.

NEW YORK

Bituminous market continues flat though agencies are still optimistic. Curtailment at anthracite collieries fails to help the market and New York Harbor is choked with coal. Some low prices being quoted.

Bituminous—While there has been no tangible change in the demand for bituminous coal the market has strengthened and the prospects for a still better situation are encouraging. The improvement is principally due to increased orders from regular customers who apparently wish to take advantage of the present situation to enlarge their stock piles. The possibility of many Italians employed in the mines returning to their native country has become something of a factor in the situation.

The export business is constantly increasing. New inquiries are being received regularly, a recent one coming from Italy for about 200,000 tons. A shortage of cars is reported along the Baltimore & Ohio and the Chesapeake & Ohio roads but no serious trouble is anticipated.

Local shippers are encouraged by the increased demand and the resultant slight advance in general quotations. While stray cargoes have been picked up at slightly lower prices the lowest average quotation noted is $2.35 f.o.b.

Quotations on the various grades are as follows:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek	$3.00@3.10	$3.00@3.10	$3.00@3.10	$1.45@1.55
Clearfield:				
Medium	2.65@2.80	2.55@2.65	.....	1.10@1.25
Ordinary	2.55@2.60	2.55@2.60	.....	1.00@1.10
Broad Top Mountain				1.10@1.45
Cambria County:				
South Forks	2.90@3.05	.....	.....	1.35@1.50
Nanty Glo	2.75@2.80	.....	.....	1.20@1.25
Barnesboro	2.65@2.70	.....	.....	1.10@1.15
Somerset County:				
Quemahoning	.....	2.70@2.85	2.70@2.85	1.20@1.30
Medium	2.65@2.70	2.60@2.65	2.60@2.65	1.10@1.15
Latrobe	2.45@2.55	.....	.....	0.90@1.00
Greensburg	2.75@2.80	.....	.....	1.10@1.15
Westmoreland	2.95@3.20	.....	.....	1.15@1.40
West Virginia Fairmont		2.60@2.70	2.60@2.70	0.80@0.90
Fairmont mine-run		2.50@2.60	2.50@2.60	0.70@0.80
Steam		2.45@2.50	2.45@2.50	0.90@0.95
Western Maryland		2.35@2.45	2.35@2.45	0.80@0.90

Anthracite—The hard-coal market is dull. The effects of the suspension of mining inaugurated by some of the companies has not as yet become apparent and New York harbor is choked with coal. There is plenty of all sizes to go around with much to spare. Prospects for a better market are not encouraging until the fall, unless it be in a further suspension of operations.

Shippers have had trouble with the demurrage problem. While much of it has had to do with loaded cars there has been considerable coal loaded in bottoms which has to be disposed of quickly to save extra charges; to get rid of this coal on advantageous terms has been a hard problem and some good grades have gone at what might be called extremely low prices.

Of the prepared coals, stove is in best demand; along the line the demand for this size is better than in the Metropolitan district. Nut and egg are heavy with the individuals selling at less than the April circular. The steam sizes show no improvement. Good grades of pea coal have suffered the heaviest cutting according to reports. There is no market for the buckwheat grades, some shippers being willing to take whatever they can get for them, within reason.

Quotations are as follows:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$4.65		$4.70	
Egg	4.90	$4.80	4.95	$4.85
Stove	4.90	4.80	4.95	4.85
Chestnut	5.15	5.00	5.20	5.05
Pea	3.35@3.50	3.10@3.35	3.40@3.55	3.15@3.40
Buckwheat	2.50@2.75	2.25@2.50	2.55@2.80	2.30@2.55
Rice	2.00@2.25	1.90@2.10	2.05@2.30	2.00@2.25
Barley	1.75@2.00	1.60@1.75	1.80@2.05	1.85@2.10

PHILADELPHIA

Lack of tone in anthracite. Volume of business decreasing, although domestic sizes are well taken up on the curtailed mining. There is no indication of any change in bituminous.

Anthracite—The past month has been in marked contrast with the corresponding period of a year ago. At that time, the demand persisted well into June, but now curtailment has been found necessary even as early as the middle of the current month. The companies are handicapped for facilities to store their surplus sizes. The market is more than absorbing the production of broken, egg and stove on curtailed mining, and doubtless could do more than this, if the other sizes could be disposed of. Chestnut at this season of the year, usually finds a ready outlet in the Lake business, but it is understood that the large stocks carried over at the head of the Lakes have resulted in light orders. The movement of buckwheat and rice is good under the curtailed mining; chestnut and pea seem to be the most difficult to dispose of, with the latter quoted at anywhere from $1.65 to $2 at the mines.

Prices at Tidewater are about as follows:

	Circular	Individuals
Broken	$4.35	$4.35
Egg	4.60	4.60
Stove	4.60	4.60
Chestnut	4.85	4.60@4.70

Bituminous—Prices are uniform, although still at a low level. Considerable coal is moving on contract, and spot business is improving, but the indications for better conditions in the near future are not bright.

OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Julia Park	British	Baltimore[1]	River Plate	1868	$8.16
Adriatic	British	Baltimore[1]	Italy[2]	1921	10.80
Llanishen	British	Baltimore[1]	Italy[2]	2434	10.80
Nina	Italian	Baltimore[1]	Italy[2]	2171	
Mobile	Cuban	Philadelphia	Santiago	1363	
General Hubbard		Philadelphia	New Orleans	1396	
George E. Dudley		Philadelphia	Nassau	387	
Roselands	British	Norfolk	Genoa	2827	
Hartington	British	Philadelphia	Tarragona	2500	10.80
Isle	British	Baltimore	Alexandria	2485	
Gledhow	British	Baltimore[1]	River Plate		8.76
Woudrichem	Dutch	Baltimore[1]	River Plate	2524	7.56
Ryton	British	Baltimore	Montevideo	2505	8.76
Ryton (option)	British	Baltimore	La Plata	2505	8.64
Ioannis P. Goulandris	Greek	Baltimore[1]	Italy	2026	10.80
Camilla	Norwegian	Baltimore	Port Limon	1550	
Noordijk	Dutch	Baltimore	River Plate	1383	
Balto	Norwegian	Baltimore	Gothenburg	2242	
Westmount	British	Philadelphia	Havana	1171	
Esther Ann		Norfolk	Savannah	631	
Alf	Danish	Baltimore	Havana	1337	
Eveline	British	Baltimore	River Plate	1660	
Upo Mendi	Spanish	Virginia	Spain[3]	2562	10.20
Alice B. Phillips		Philadelphia	Martinique	451	
Stanley M. Seaman		Philadelphia	Porto Rico	953	
Edward Stewart		New York	Halifax	353	1.60
Egyptian Transport	British	Atlantic Range	San Diego	2924	6.46
Songa	Norwegian	Virginia	River Plate	1850	8.40
Ryton	British	Baltimore	Montevideo	2505	10.80
Dewa	British	Atlantic Range	Italy[2]	2340	
Fert	Italian	Atlantic Range	Italy[2]	3542	
Talisman	Norwegian	Baltimore	Havana	1178	
Lindisfarne (bark)	Russian	Baltimore	Buenos Ayres	1631	
Evie B. Hall		Philadelphia	Halifax	360	1.50

Note—Steamers are indicated by **bold face type,** all others being schooners.
[1] Or Virginia. [2] West coast. [3] Or Mediterranean port.

BALTIMORE

Anthracite conditions poor and betterment comes but slowly to the bituminous trade. Failure of the Northwest to figure in the spring trade is felt. Export business holds good.

Hard-coal agencies are far from satisfied with conditions. Many consumers are showing a disposition to withhold all save emergency orders. The result has been a dull period in offices of anthracite shippers.

In bituminous there is but slow response to the much talked of betterment of industrial conditions. Prices remain steady as compared with the previous week. As contracts are

closed that make the market for best grade coals a little more restricted, there is a growing tendency to hold those fuels a little tighter, but ordinary and medium grades are still offering freely at low figures. Failure of the West, and Northwest more particularly, to figure heavily in the early spring trade is being felt. West Virginia gas coals, especially, have failed of their usual spring rise.

Export business continues good. Last week the foreign movement ran close to 47,000 tons, and there is no longer any doubt but that the total for May will run considerably over the 200,000-ton mark, the first time that such a tonnage has ever been shipped from this port. Italy and the Argentine still absorb the best part of the foreign movement. Most of the coal going from this port to Italy is for street railway and electric lighting plant use which only a successful invasion of Italy could well halt.

Charters for the past week included the following:

Vessel	Nationality	To	Rate
Monkshaven	British	River Plate	$9.54
Evaline	British	River Plate	9.60
Fert	Italian	West Coast of Italy	....
Camilla	Norwegian	Port Limon	....
Egyptian Transport	British	Tiburon	....
Enrico Parodi	Italian	West Coast of Italy	10.80
Dewa	British	West Coast of Italy	10.80
Ocland	Norwegian	Daiquiri	.....
Alf	Danish	Havana	..
Iolannis P. Goulandris	Italian	West Coast of Italy	10.80
Panughi Lykiardopoulus	Greek	River Plate	9.36
Balto	Norwegian	Gothenburg, Sweden	...
Isle of Jura	British	Alexandria, Egypt	11.00
Gledhow	British	River Plate	9.60

HAMPTON ROADS

Export shipments still large. Government takes coal for west coast. No change in prices. Coal going in storage at Sewalls Point.

Dumpings over the piers at tidewater have made a good showing during the week although the coastwise shipments are perhaps not so heavy as anticipated. The export movement from Hampton Roads is still large, especially to the Italian market which has taken over 60,000 tons during the week. The movement to the Canal Zone and Brazilian ports has shown up well and while a number of the cargoes to Brazil have been handled by schooners one large cargo of 6000 tons went by steamer to Santos. The largest cargo of the week, however, went to the Canal Zone by the new collier "Ulysses." This vessel took 12,021 of cargo and 979 tons of bunker coal.

The export movement is all Pocahontas or New River mine-run. The New England coastwise shipments have consisted of high volatile mine-run, smokeless and also prepared coals and nut and slack, and have moved to Boston, Calais, Me., Providence, Portland, New Bedford, and Everett. Bunker vessels coaling during the week have taken in some cases as much as 1800 tons and over, due probably to scarcity of coal in European ports.

There has been practically no change in prices at tidewater. The accumulation of coal on the railway yards is still somewhat in excess of normal with a fair quantity moving from the mines. There is, however, a heavy amount of vessel tonnage due which should cut well into the accumulation. Coal is now being dumped into the storage plant at Sewalls Point and it is expected this will be continued during the summer or at least until the demand is such that coal cannot be gotten forward from the mines fast enough to supply vessel tonnage as it arrives.

Coal shipments from Hampton Roads week of May 14 to 21 were:

Norfolk			Norfolk		
Vessel	Destination	Tons	Vessel	Destination	Tons
Carmen[1]	Genoa	7008	**Procida**	Genoa	5471
Ulysses	Cristobal	12021	Pendleton Sisters	Lisbon	1391
Solone	Genoa	4678	**Swindon**	Messina	6880
Belgier[2]	Genoa	8455	**Berwindvale**	Havana	8100
Rosalia	Santos	6080	**Juno**	Cagliari	4634
Vittorie	Cagliari	3383	S. P. Bowers	San Juan	919
Enricheta	Messina	6700	**Nea Ellas**	Piraeus	5496
Bygland	Kingston	3600	**Margaret**		
Angeesea	Genoa	7859	**Thomas**	Pernambuco	1840
Teno	Valparaiso	1095	E. W. Hinckley	St. Michaels	1095
Howth Head	Las Palmas	5689	Newport News		
Ella M. Wiley	Rio Janeiro	911			
Maude Palmer	Para	2416	**Ydun**	Tampico	1733
W. H. Sumner	Maranhan	720	**Stromboli**	Genoa	7200

Note—Steamers are indicated by **bold face type**, all others being schooners.

Shippers—[1] Flat Top Fuel Co. [2] Pocahontas Fuel Co.

Railroad Tonnages—Dumpings over the local piers for the past several weeks were as follows:

	Week Ending			
Railroad	May 1	May 8	May 15	May 22
Norfolk & Western.....	.....	208,179	151,113	162,921
Chesapeake & Ohio.....	60,967[1]	88,609[2]	80,045	84,286
Virginian.....	65,099	45,116	57,903	39,431
		341,904	289,061	286,638

[1]Week ending Friday. [2]Nine days.

OCEAN FREIGHTS

South American charters easier. Activity in negotiations for Spanish and Italian tonnage.

The export coal trade is growing daily and numerous steamers have been chartered for this business since our last report.

South America—These rates are softer and steamers can now be secured at concessions under last fixtures.

Mediterranean—A number of steamers were chartered since our last report at $10.80 to west coast of Italy, and it is too early to state what effect the entrance of Italy into the war will have upon freight rates to this destination. Seven or eight steamers were recently chartered to take coal to Spanish ports, some for four voyages at $9.60 and others for single voyages at $10.20. We daily have boats offered us at $9.60 for single voyages and at $9.24 for four voyages to Spanish ports, other terms being 500 tons per day discharge at 1 peseta, Spanish dues for account of cargo.

Cuba and West Indies—A few steamers were chartered for these destinations during the past week, and rates are unchanged.

To	Rate	To	Rate
Havana	$2.00@2.25	Bermuda	$3.50@3.75
Cardenas or Sagua	3.00@3.25	Vera Cruz	3.50
Cienfuegos	2.75@3.00	Tampico	3.50
Port au Spain, Trinidad	3.75@4.00	Rio	8.64@9.12
St. Lucia	3.50@3.75	Santos	8.88@9.12
St. Thomas	3.25	Montevideo	7.92
Barbados	3.75@4.00	Buenos Aires or La Plata	8.16@8.40
Kingston	2.75@3.00	Rosario	8.40@8.64
Curacao	3.75@4.00	Mediterranean*	10.80
Santiago	2.75@3.00	Spain**	9.36@9.60
Guantanamo	2.75@3.00	Valparaiso†	6.72
Demerara	5.25@5.50	Marseilles	10.80

Note—Rates noted in **bold face** type are only approximate.
* To a direct port on the West coast of Italy.
† With 800 tons per day discharge.
**Spanish dues for account.
W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Pittsburgh market adversely affected by Ohio settlement. Prices not quotably changed, however. Mining at 50 to 60% of capacity.

The Pittsburgh district coal trade, already in poor shape, cannot expect to be improved by the settlement of the labor troubles of so long standing on the other side of the state line. It has frequently been stated in Pittsburgh coal circles that the troubles of the Pittsburgh district's coal market have arisen, not so much from competition within, as from competition without. It has been difficult for the Pittsburgh district to meet the other districts in competitive markets, and the consumptive area directly tributary to Pittsburgh is naturally far from sufficient to operate the mines even at one-half capacity, particularly when the steel industry and its customers are operating at only about 70% capacity.

Pittsburgh coal prices are not quotably changed, except that slack, with the growth of the Lake season, has softened a trifle further. Prices on free coal are about as follows: Slack, 55@65c.; nut and slack, 90@95c.; nut, 95c.@$1; mine-run, $1@1.05; ¾-in., $1.10@1.15; 1¼-in., $1.20@1.25, per net ton at mine, Pittsburgh district. On Lake coal the usual asking price is $1.15 and while this is an extremely low price compared with other seasons, it has been shaded occasionally. On contracts with regular consumers to run to Mar. 30 the usual asking price is $1.15 on mine-run, but this can also be shaded. The mines are operating at 50 to 60% of capacity.

BUFFALO

Improvement in trade hardly perceptable though some shippers report better conditions. Anthracite continues as dull as ever.

Bituminous—The consumer is very slow about buying. There is no stocking up and sellers have to depend on a temporary business. Concessions in prices are necessary to get rid of lagging shipments and consumers now refuse to buy at all except at reduced prices. The railroads are not buying as much coal as three months ago, though stocks of fuel must be getting low.

There is no improvement in the Canadian trade, which was poor before the European war began, and has been growing steadily worse right along. The Canadian view of the situation is that an actual state of war exists and nothing but emergency measures should prevail.

Bituminous prices are still based on $2.70 for Pittsburgh lump, $2.55 for three-quarter, $2.45 for mine-run and $2.25 for slack.

Anthracite—There is no improvement as yet and a very quiet summer is in prospect. The movement by Lake is the only branch that shows activity. The rail-line trade has fallen off still more of late, so that the Lake loadings did not take care of the surplus and some of the companies have been forced to curtail operations, which is rather unusual for this time of the year.

The city trade is so quiet that the retailers are obliged to turn their teams to other work earlier than usual, which is not easy to do. On the other hand the natural-gas operations in this section are very active. This week a new well came in near here with a flow of 1,000,000 ft. of gas daily. Other wells are going down in the same district and they tell heavily against the anthracite trade.

The Lackawanna and Lehigh Valley docks are very active in loading coal for the Upper Lakes, the total for all companies being 156,500 tons for the week.

TORONTO, CAN.

Demand substantially less than normal and the outlook generally discouraging.

Market conditions are unchanged and trade in all lines continues quiet, the demand being considerably below normal. Enforced economy among working people, owing to unemployment or decreased earnings, has reduced sales of anthracite for domestic uses and manufacturing, except in a few lines is inactive, many consumers buying merely from hand to mouth. Prices for best grades are as follows: Retail anthracite egg, stove and nut $7.50; grate, $7.25; pea, $6; bituminous steam, $5.25; screenings, $4.25 to $4.50; domestic lump, $6; cannel, $7.50. Wholesale f.o.b. cars, three-quarter lump, $3.56; screenings, $2.90.

TOLEDO

Light Lake movements. Contract coal not selling well just now. Prices holding close to list on sales made.

The coal market here continues dull, the movement is light and the Lake movement is very slow. Threshing coal is in fair demand and it is believed that railroad contracts will be made within a few months. The opening of the Pittsburgh No. 8 mines will not make much difference in the Toledo situation except that more of that coal will be handled, but it will be at the expense of the West Virginia product. There is no heavy movement of smokeless coal although some of the prepared sizes are difficult to secure. Hocking grades are moving slow. Cambridge and Kentucky coals are in fair demand and list prices are being fairly closely maintained on all lines. There are not many contracts being made.

CLEVELAND

The market is unchanged with fluctuations confined to narrow limits. The Lake trade is slowly improving.

The market is just holding its own. The supply of coal that ordinarily goes to the Lakes and leaves the Cleveland market with a surplus of fine coal is not as large as in other years. There were ample stocks of all kinds of coal, and buyers were able to get practically the same prices on anything they wanted.

No. 8 operators and miners formally signed the contract in Cleveland last week. This officially ended the strike and all No. 8 operators are about ready to ship some coal. So far no No. 8 coal has come into the open market. The larger companies that have Upper Lake dock connections are planning to restock the docks which have not received any No. 8 coal in more than 18 months.

Lake shipments are slightly better than two weeks ago, but some of the shippers are confining themselves to such coal as they are forced to take. The supply of boats exceeds the number of cargoes except small boats. These are not in operation and shippers are not able to move cargoes under 4000 tons as promptly as they would like to.

Quotations for shipments to jobbers are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	W. Va. No. 8
Lump	$3.10	.....	.....	.....	.....
Lump, ¾ in	.....	$2.20@2.25	$2.00	$1.80@1.85	$1.75@1.85
Egg	3.10	.....	.....	.....	.....
Mine run	2.65@2.70	2.10	1.85	1.85@1.90	1.75@1.85
Slack	.....	1.65@1.70	1.60	1.65@1.70	.....

COLUMBUS

Buying for school purposes and the approach of the stocking season cause better demand for domestic grades. Steam business is still slow.

One of the features of the trade during the week was the better feeling in domestics because of school buying. Considerable outside buying is also being done for delivery during the coming month. This has given a certain firmness to domestic grades and causes a better feeling in coal circles generally. Some attention is being given to the stocking season, which is expected to be earlier than usual.

Retail trade is quiet but prices are holding up firm on all grades. Retailers' stocks are not heavy and they must come into the market before the stocking season arrives. Another feature is the demand from rural sections for threshing purposes, which is a noticeable factor in Ohio during June and July.

Steam business is quiet all along the line. Manufacturing is still slow, with the exception of war materials and consequently fuel requisitions are not large. Railroads are taking the normal tonnage for freight movement; practically all of the railroad fuel contracts have now been closed. Contracting for steam tonnage is slow because of cheap coal; contracts are being made at a less rate than prevailed last year.

Lake trade is quiet although a larger tonnage from Ohio mines is going to the Northwest. Chartering of boats is not very active because of the uncertainty of the future. A number of Ohio operators do not expect to do any Lake business until after July 1. Docks at the Upper Lake ports are still congested and the interior movement is slow.

Production in Ohio fields has not been increased with the exception of the Pomeroy Bend district which now reports 50 to 60% of the average. In the Hocking Valley the output has been 35% and the same is true of Jackson and Cambridge fields. In the Crooksville field the output is 30%. The production in most fields is expected to be increased as soon as the stocking season opens in full blast.

There is a better demand and higher prices for the small sizes due to curtailed production.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Rescreened lump	$1.45	$1.50	.....
Inch and a quarter	1.30	1.35	$1.30
Three-quarter inch	1.25	1.30	1.25
Nut	1.15	1.25	1.15
Mine-run	1.05	1.10	1.05
Nut, pea and slack	0.65	0.70	0.65
Coarse slack	.55	.60	.55

CINCINNATI

A slight improvement in the steam market. Supplies still in excess of demand, due to progress of the Lake movement of domestic. Contracting is noticeably slow and backward.

Close observers are of the opinion that the industrial situation has improved to some extent and that there has been an increase in steam consumption. Lack of confidence seems to be the principal trouble. Contracting is more backward than for several years, many large consumers refusing to tie themselves up for a supply of coal in spite of a general feeling that the trend of prices from now on will be toward higher levels. Hand-to-mouth purchasing continues the rule although price concessions are not believed to be so general. The domestic market is to some extent affected by the same disinclination of the trade and consumers to buy ahead.

LOUISVILLE

Somewhat better tone to the market generally though retail trade is heavy.

The week has seen a turn for the better in the Kentucky coal market, both as to the industrial and the domestic trade. The stocking movement of the retailers has begun on a more or less extensive scale, which is having the result of increasing the supply of steam coals and reducing their prices, while at the same time the working periods are being extended. The Illinois Central has announced that it will store no coal this summer but increase in its current requirements has been of assistance to western Kentucky.

Prices, f.o.b. mines, range about as follows: Block, $1.40 to $1.85; No. 1 steam run of mine, $1; four-inch, 80 to 85c. and nut and slack, 50 to 65c. The retail situation is said to be most distressing with coal in Louisville cheaper than for many years.

COKE

CONNELLSVILLE

Furnace coke market dragging, with fair activity in foundry coke contracting.

The Connellsville coke market still drags. There is more or less inquiry for furnace coke, but it all seems to be of a desultory character. Foundry coke continues its activity as to contracting, but as it is still more than a month until present contracts expire the buying is of a quiet character, and chiefly by consumers who always take the best grade of coke, of which there is only a limited supply. The four operators making a specialty of the highest grade foundry coke are asking $2.40, but some will close freely for the twelvemonth and others are trying to limit contracts to six

months, with only a moderate degree of success. We quote: Furnace coke, prompt, $1.50@1.55; to July 1, $1.60; to Jan. 1, $1.75; foundry coke, prompt, $2@2.40; contract, $2.20@2.40, per net ton at ovens.

The "Courier" reports production at 297,554 tons and shipments at 295,967 tons for the week, showing no material change from the preceding week.

Buffalo—The recent slight stir in coke has not been maintained and the market has settled down again to the old quiet state, with prices still at the bottom, on the basis of $4.15 for best Connellsville foundry and $3.15 for stock coke.

Chicago—The coke market is dull and weak, with no signs of improvement. Very little, if any coke is being sold at present, but some contracts for foundry coke are being discussed. Prices are as follows: Byproduct, $4.45@4.65; Connellsville, $4.60@4.75; Wise County, $4.50@4.65; gas coke, $3.75@4; furnace, $4.50@4.65.

MIDDLE WESTERN

GENERAL REVIEW

Screenings active at strong prices but domestic sizes flat. Some buying from the Northwest. Anthracite moving slowly.

Prices are generally well maintained considering the lack of demand. Some operators are confronted with the problem of having to meet a normal demand for screenings when practically no orders are being received for the coarse sizes. Retal trade is on a very moderate basis, and it is said that some of the yards are slashing prices to keep their equipment busy. It is hoped that consumers who usually buy during the low-priced periods will begin to lay in their supplies next month. The movement of soft coal via the Lakes is still very slow.

The volume of domestic trade is less than usual at this time of the year. The dealers are probably awaiting what is usually termed the "summer storage season" before stocking. Last year considerable high priced coal was carried through the winter and dealers will be careful to avoid a repetition of this state of affairs.

Contracting is still delayed. A few buyers from the Northwest have appeared to look over the situation, make inquiries and close some contracts for the coming season's supply. There is a tendency on the part of these buyers to make their purchases direct from the operators instead of dealing with jobbers. The consumption of railroad coal has fallen off generally since May 1, and the best informed do not expect an increased consumption until late mid-summer.

CHICAGO

Heavy demand for screenings. Railroads holding off for lower prices. Some activity in contracts on smokeless.

Conditions in the Southern Illinois field have changed but little; screenings are the feature of the trade, and have been soaring around the highest mark of the year. Prices for other sizes are well maintained, although the demand is nil.

The situation in Indiana continues about the same, with the domestic trade dwindling to almost nothing and no improvement anticipated before the middle of June. There is no activity in the steam coals except screenings, although the limited production is holding prices steady. There has been some price cutting in order to move a few shipments of domestic coal to retail yards in Indianapolis.

The railroads are not placing contracts for Springfield coal as fast as anticipated, and are evidently out for lower prices. Screenings are the feature of this district, bringing around 85c. with the prospects of going higher.

The smokeless situation is much stronger, and there is no record of any lump or egg having been offered in the Chicago market during the last week at less than $1.70. The retail yards are reported to have little of this coal on hand, and it is felt that they will soon be ordering heavily. There is quite a little contracting for smokeless coals, some retailers evidently believing that they had better get under cover before it is too late, in view of the export situation.

There is little buying in splint coals, and some spot shipments have been sold at off prices.

The Hocking situation is unchanged from last week, and prices are variable without, however, any spot coal on the market to be sacrificed.

Eastern Kentucky coals are offered at all kinds of prices but little tonnage is being taken.

Anthracite is slow, but no doubt the closing days of this month will find orders largely increased. The retailers are buying very small quantities for current consumption, and have not yet placed their storage orders. Circular prices are being maintained by the independents.

	Williamson and Franklin Cos.	Springfield	Sullivan	Clinton	Greene Co.
Lump.....	$1.25@1.35	$1.15@1.30	$1.35@1.50	$1.25@1.50	....
Steam lump	....	1.15@1.20	1.15@1.25	1.10@1.25	....
2½-in. lump.	....	....	1.20@1.30	1.15@1.25	....
1¼-in. lump.	....	....	1.05@1.25	1.10@1.15	....
Mine-run...	1.10	1.00@1.10	0.85@1.10	1.00@1.10	....
Egg.....	1.25@1.35	1.15@1.25	1.15@1.25	1.15@1.25	....
No.1washed	1.25@1.35	....	1.50@1.60	....	....
No.2washed	1.20@1.30	....	1.75	....	....
Nut.....	....	1.00@1.05	0.95@1.10	1.00@1.10	....
No. 1 nut..	1.25@1.35	....	....	....	....
No. 2 nut..	1.25@1.35	....	....	....	....
Screenings..	.90@1.00	0.85@0.90	.80@0.95	0.85@0.95	....

	Harriaburg Saline Co.	E. Kentucky	N. Riv. & Poca.	Somerset	Hocking
Lump.....	$1.25@1.35	$1.15@1.35	$1.70	$1.50	1.3 @1.50
1¼-in. lump.	1.15@1.25	1.15@1.25	....	....	....
Mine-run...	1.00@1.10	....	1.25	1.15@1.25	....
Egg.....	1.10@1.25	0.95@1.10	1.60@1.70	1.40@1.60	1.25@1.40
No. 1 nut..	....	....	....	....	1.15@1.25
Screenings..	0.85@0.95	....	....	....	....

Greene County 5-in. lump, $1.25@1.35; 3-in. lump, $1.15; 5-in. egg, $1.10@1.15; 3-in. egg, $1.05@1.15; mine-run, $1@1.10; screenings, 85 to 95 cents.

INDIANAPOLIS

Slight improvement in both steam and domestic demand. Situation still generally heavy.

Conditions show little change, week by week and mine operations are down to the summer level though the mine owners seem quite cheerful as to the future. There is a slight improvement in the demand for steam grades and if this keeps up, the industry will eventually be on a normal basis again. May has been much cooler, relatively, than April and even March, and there has been an unexpected call for domestic lump. Screenings are still in first class demand at prices ranging from 80c. to 95c. Conditions do not justify throwing coal on the local market and operators prefer to limit the output of the mines to the current necessities of the trade. The mines are running three to four days a week. Money is plentiful and the crop outlook satisfactory.

ST. LOUIS

Selling combine in the Standard district collapses. Good movement on retail storage orders. Steam business weak.

The break-up in the selling organization for the mines in the Standard district is the feature of the market. Parties to the agreement commenced cutting prices on the excuse that they had coal to move and must meet competition. The independents claim it is a price-cutting war to force them into the arrangement. There is very little domestic coal moving either in the city or country. The steam demand is exceptionally light and prices are weaker. Carterville is held at about 85 to 95c., and Standard 80 to 85c.

Anthracite is doing fairly well; it is not being pushed too hard so the tonnage moving is easy. Smokeless tonnage is slightly better than a year ago, but not in the volume that it formerly moved.

In the retail trade advance storage orders for future delivery are good; present delivery is about the same as 1914, which showed a remarkable falling off from previous years. This would indicate that business conditions are considerably below normal, and that the future is somewhat of an uncertainty to the ultimate consumer.

KANSAS CITY

Business somewhat improved and trade rather better than usual.

The retail business in Kansas City showed a slight improvement during the week, due to the cool rainy weather, but it was hardly great enough to be noticed and did not affect prices in any way. The wholesale business is gradually increasing and the companies report that they are selling all the coal that is coming into this market. Both the retail and the wholesale prices are still down to the low point and most of the operators will leave them there for the summer trade.

PRODUCTION AND TRANSPORTATION STATISTICS

BALTIMORE & OHIO

The following is a statement of coal and coke tonnage moved over this system and affiliated lines during April and the previous two months:

	February		March		April	
	1915	1914	1915	1914	1915	1914
Coal.....	1,906,210	2,385,243	2,094,607	3,173,972	2,159,914	2,131,812
Coke.....	232,111	265,380	257,099	356,164	289,369	343,962
Total....	2,138,321	2,650,623	2,351,706	3,530,136	2,449,283	2,475,774

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for March, 1914-15, and for the nine months ending March, 1913-14-15, in long tons:

	Nine Months			March	
Imports from:	1913	1914	1915	1914	1915
United Kingdom	7,451	9,691	29,950	1,231	2,680
Canada	1,061,411	746,286	842,440	91,645	99,940
Japan	42,657	83,208	68,251	1,732	4,050
Australia and Tasmania	117,158	197,925	141,880	25,798	17,749
Other countries	3,257	3,430	1,507	1,420	60
Total	1,231,934	1,040,540	1,084,028	121,826	124,479
Exports:					
Anthracite					
Canada	3,324,179	2,607,383	2,411,403	162,152	125,114
Argentina	.....	.....	212	.....	212
Brazil	.....	.....	6	.....	.....
Uruguay	.....	84	.....	.....	.....
Other countries	58,947	46,639	41,710	1,279	1,869
Total	3,383,126	2,654,106	2,453,331	163,431	127,195
Bituminous					
Italy	.....	.....	706,960	.....	72,371
Canada	8,295,614	9,577,352	6,581,129	620,366	273,395
Panama	340,259	281,394	218,397	23,690	47,600
Mexico	264,537	235,122	305,953	29,978	34,899
Cuba	915,889	902,437	781,559	115,303	110,585
West Indies	456,013	425,071	323,960	44,614	46,563
Argentina	.....	99,388	217,797	22,978	33,404
Brazil	.....	196,837	273,015	11,150	42,827
Uruguay	.....	40,492	40,767	18,453	10,273
Other countries	741,597	905,457	513,103	132,080	20,937
Total	11,013,909	12,663,550	9,962,640	1,018,612	692,854
Bunker coal	5,377,071	5,754,530	5,031,390	643,942	579,027

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for March and the nine months of the fiscal years 1914 and 1915, in short tons:

	March				Nine Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater	314,726	22	323,567	20	2,675,382	17	2,587,748	19
East	205,419	14	242,136	15	1,885,871	12	1,987,701	15
West	811,645	57	931,657	59	10,111,010	65	8,163,886	60
Total	1,331,790		1,497,360		14,672,263		12,739,335	
From Connections								
Bituminous	104,007	7	98,733	6	833,501	6	825,951	6
Anthra. (local)	158				406			
Anthracite	283		945		10,706		11,421	
Total	1,436,238	100	1,597,038	100	15,517,063	100	13,576,707	100
Coke	18,373		40,658		134,996		292,105	

BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads during March and the first three months of the last two years, in short tons:

	March		3 Months	
Anthracite	1914	1915	1914	1915
Baltimore & Ohio[1]	149,483	88,592	407,542	307,448
Chesapeake & Ohio[1]	945	441	3,051	2,172
Erie[2]	740,234	664,440	2,128,608	1,910,876
Pennsylvania[1 3]	1,086,344	814,872	2,706,391	2,480,729
Virginian[2 1]	43	.....	52	85
Total 5 roads	1,977,049	1,568,345	5,245,644	4,701,316
Bituminous				
Baltimore & Ohio[1]	3,338,058	2,238,382	8,952,917	6,702,615
Buffalo, Roch. & P.[1 2]	923,513	636,918	2,495,420	1,811,524
Buffalo & Susq.[1 2]	150,187	76,810	432,926	271,844
Chesapeake & Ohio[1]	1,596,093	1,435,797	4,390,821	4,514,474
Erie[2]	6,096	10,300	28,203	30,166
Hunt. & Br'd T. Mt.[1 2]	127,110	72,733	329,957	237,885
New York Central[2]	918,706	708,397	2,492,765	2,203,206
Norfolk & Western[1 2]	2,112,118	1,904,752	5,744,407	5,412,711
Pennsylvania[1 2]	4,740,313	3,243,270	12,414,492	9,845,684
Pitts. & Lake Erie[1 2]	1,304,413	592,546	3,090,822	1,736,916
Pitts. Shaw. & North[1 2]	256,971	166,783	791,255	592,098
Virginian[1 2]	336,952	309,414	1,003,817	936,983
Western Maryland	317,335	281,634	843,232	846,988
Total 13 roads	16,127,865	11,677,736	43,011,034	35,143,094
Coke				
Baltimore & Ohio[1]	356,164	257,099	896,499	710,605
Buffalo, Roch. & P.[1 2]	28,878	35,006	79,699	100,424
Buffalo & Susq.[1 2]	41,162	53,906	110,859	150,654
Chesapeake & Ohio[1]	40,658	18,373	111,108	44,119
Norfolk & Western[1 2]	103,070	71,124	317,684	209,924
Pennsylvania[1 3]	1,027,339	876,532	2,700,237	2,303,835
Pitts. & Lake Erie[1 2]	521,626	380,827	1,341,139	959,545
Western Maryland	9,402	4,176	24,138	8,201
Total 8 roads	2,128,299	1,697,043	5,581,363	4,487,307

Total Coal and Coke 13 Roads	1914	1915
January	18,157,998	15,685,798
February	15,446,830	13,702,789
March	20,233,213	14,943,124
Total 3 months	53,838,041	44,331,711

[1] Includes coal received from connecting lines.
[2] Includes company's coal.
[3] Does not include company's coal hauled free.

Note:—The Southern Railway hauled 250,919 short tons of bituminous coal during March, 1914, and 537,162 short tons during the three months ending March.

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for April of the current year and the four months of 1914 and 1915, in short tons:

	April		Four Months	
	1915	1914	1915	1914
Anthracite	1,126,690	1,050,365	3,607,419	3,705,806
Bituminous	3,358,062	3,437,040	13,203,746	14,967,184
Coke	832,427	910,560	3,136,262	3,593,030
Total	5,317,179	5,397,965	19,947,427	22,266,014

I. C. C. Nos. 5572, 5584, 5651—Campbells Creek Coal Co., Campbells Creek R.R. Co., H. C. Dickinson vs. Ann Arbor R.R.

Upon rehearing; **Held,** That through routes and joint rates should be established for the transportation of coal from points on the line of the Campbell's Creek R.R. to the interstate destinations mentioned in Kanawha & Michigan Ry. tariff I. C. C. No. 31 and supplements thereto, and such joint rates should not exceed the main-line or district rates now applied from points on the lines of the Coal & Coke and the Kanawha & West Virginia railroads to the same destinations.

I. C. C. No. 6415—E. I. Du Pont De Nemours Powder Co. vs. Wabash R.R. Co., Et al.

The Wabash R.R. Co. filed and posted a tariff naming a through rate of 90c. per net ton on bituminous mine-run coal in carloads from Springfield and Riverton, Ill., to Mooar, Iowa, in which the delivering line was not named as a party and had not concurred. Charges were collected on shipments from and to the points named on the basis of the combination of intermediate rates. Reparation awarded against the carrier which issued the tariff, on showing that complainant relied on the through rates published, to its injury.

FOREIGN MARKETS

GREAT BRITAIN

Rearrangement of export business under the new rules. Opening of navigation at Archangel.

May 14—The chief feature of the coal markets throughout the country this week was dullness and lack of all activity on account of foreign business, by reason of the uncertain position created by the new coal-export regulations. It is stated that already a good many lincenses to ship coals to Scandinavia on near dates have been promptly received, though there are reports that some licenses for Sweden have been refused. The news that the port of Archangel, through the special efforts of the icebreakers, has now been opened to navigation marks the commencement of activity from Newcastle district to the White Sea. Trading has already commenced, and several steamers are on their way from this country.—"The Iron and Coal Trade Review."

Exports—British exports for April and the first four months of the past three years were as follows:

	April			Four Months		
To	1913	1914	1915	1913	1914	1915
Russia	347,247	218,445	5,404	792,367	771,000	5,404
Sweden	435,533	281,932	264,286	1,322,657	1,028,010	1,021,563
Norway	186,251	185,219	228,765	827,169	880,543	921,109
Denmark	270,312	193,853	258,217	1,053,446	913,622	991,224
Germany	804,747	691,939	.....	2,682,372	2,566,953	.....
Netherlands	156,411	134,516	102,532	711,731	552,708	540,184
Belgium	177,612	102,393	.....	792,286	594,384	.....
France	1,124,623	977,847	1,478,279	4,352,416	4,769,297	5,398,042
Portugal[1]	117,098	111,833	65,823	494,570	464,695	365,130
Spain[4]	295,067	292,197	167,567	1,322,086	1,251,119	706,610
Italy	793,528	659,192	462,391	3,222,576	3,051,507	2,222,413
Aus. Hung.	65,413	86,036	.....	465,498	304,226	.....
Greece	67,490	65,684	38,647	217,325	252,713	150,425
Roumania	16,644	29,348	.....	23,932	75,673	.....
Turkey	13,420	45,741	3,073	47,096	217,375	3,073
Algeria	107,471	88,068	108,356	482,990	409,922	361,051
Portuguese[5]	33,719	23,682	7,598	111,360	86,658	73,135
Chile	68,615	37,207	9,139	211,558	184,065	21,979
Brazil	234,089	93,327	94,551	730,608	487,546	258,055
Uruguay	71,901	54,148	30,275	254,346	238,260	158,950
Argentine	338,859	312,518	201,020	1,258,061	1,324,264	738,891
Channel Is.	16,066	9,434	12,454	48,848	50,885	44,749
Gibraltar	35,021	48,132	31,708	140,950	145,445	134,468
Malta	66,064	31,443	13,101	312,313	180,366	41,795
Egypt[2]	352,066	263,695	120,815	1,092,081	1,146,699	517,512
Aden[3]	9,461	10,761	24,746	42,075	63,412	46,841
India	12,146	26,659	261	77,787	66,959	11,171
Ceylon	11,259	36,508	.....	72,380	123,224	17,131
Miscell'ous.	122,736	102,261	40,756	426,994	442,857	238,585
Coke	70,200	67,615	70,523	352,390	369,364	305,697
Briquettes	184,145	164,095	145,559	691,347	666,276	388,907
Total	6,605,214	5,445,728	3,985,846	24,633,615	23,680,027	15,684,094
Bunker	1,795,946	1,624,282	1,175,764	6,747,177	6,659,730	5,154,395

[1] Includes Azores and Madeira. [2] Including Anglo-Egyptian Sudan. [3] And dependencies. [4] And Canaries. [5] West Africa.

Note—The figures in the above table do not include Admiralty and certain other shipments.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

For the official advertisements of bids wanted see the Contracts-to-Be-Let Section on page 12.

✚Indicates contracts regarding which official information has been received.

Recast

In the following table we give a list of all old contracts coming up for consideration during the ensuing week. The table gives our contract number, the name of the purchaser, city, tonnage and page on which the detail notice appeared:

No.	Purchaser	City	State	Tonnage	Page
475	Rock Island Arsenal	Rock Island	Ill.	200b	675
475	Rock Island Arsenal	Rock Island	Ill.	100c	675
599	J. M. Robin, Nort. & Co.	Louisville	Ky.		794
600	The American Elec. Co.	Chicago	Ill.	150*	794
601	Clinton Sugar Refin. Co.	Clinton	Iowa	70,000	794
603	Inter-Sou. Life Ins. Co.	Louisville	Ky.		795
606	Bash Fert. & Chem. Co.	Fort Wayne	Ind.		795
608	Lou'v'e. Cereal Mills	Louisville	Ind.	125†	795
610	McDonald Mfg. Co.	Dubuque	Iowa		795
614	Board of Education	Titusville	Penn.	2,000	795
617	Municipal Government	Kalamazoo	Mich.	2,000	795
621	Municipal Government	Luverne	Minn.	1,500	795
623	Municipal Government	Newton	Iowa	140†	795
624	Board of Education	Providence	R. I.	8,500a	795
640	City Government	Fall River	Mass.	8,000b	834
680	Bd. of School Comrs.	Utica	N. Y.	3,200ab	876
705	Board of Education	Corning	Iowa	200	877
716	Bur. of Sup. & Accts.	Puget Sound	Wash.	100c	916
717	Board of Education	Burlington	Iowa	2,200	916
725	County Comrs.	Northampton	Mass.		916
729	3rd Miss. R. Dist.	Vicksburg	Miss.	10,000b	916
751	United States Navy	Washington	D.C.	12,155a	917
751	United States Navy	Washington	D. C.	200b	917
752	United States Navy	Washington	D. C.	7,470c	917

a Indicates anthracite coal. b Indicates bituminous. c Indicates coke. * Per month. † Per week.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

✚No. 664—Washington, D. C.—Complete list of bids on this contract (p. 836) are given in the accompanying tables. The B.t.u. value of the coal on which the bid is made is given under each quotation.

CLASS 1—45,000 tons, for power plant, Brooklyn.

CLASS 2—50,000 tons steaming coal, (a) for delivery, f.o.b. lighters at Navy Yard, Brooklyn, (b) for delivery in New York Harbor, in lighters alongside vessels, (c) for delivery in New York Harbor, coal unloaded, stored, and trimmed on following vessels, 1, "Solace," 2, "Gloucester," 3, "Culgoa," 4, "Machias," 5, "Wasp," 6, "Tonopah."

CLASS 3—45,000 tons steaming coal, (a) f.o.b. barges at piers, Philadelphia, (b) f.o.b. lighters alongside at Navy Yard, Philadelphia, (c) f.o.b. cars, Navy Yard, Philadelphia.

CLASS 4—35,000 tons steaming coal, Philadelphia Navy Yard, (a) for delivery f.a.s. wharf, (b) f.o.b. cars.

CLASS 5—7500 tons steaming coal, (a) f.o.b. U. S. naval barges at Baltimore, (d) in supplier's barges, f.a.s. ships or wharf, Annapolis, Md., (e) f.a.s. ships or wharf, to be stored and trimmed on ships or stored ashore at contractor's expense.

CLASS 6—75,000 tons steaming coal, Baltimore, (a) f.o.b. barges at piers, (b) in vessels alongside vessels in harbor, (c) in lighters alongside in river between Sparrows Point and Harbor Limits including discharging and trimming in bunkers, (d) in lighters alongside within Harbor Limits, including discharging and trimming in bunkers.

CLASS 7—7500 tons steaming coal, f.o.b. cars, Washington Navy Yard.

CLASS 8—400,000 tons steaming coal, (a) f.o.b. vessels or barges under chutes at piers, Hampton Roads, (b) f.o.b. vessels under chutes at piers, Philadelphia.

CLASS 9—Item 1, 8000 tons semibituminous coal, f.o.b. cars, Navy Yard Charleston, S. C., item 2, 4000 tons semibituminous coal, (a) f.o.b. lighters alongside U. S. naval vessels in Charleston harbor, (b) delivered to vessels alongside contractor's wharf, Charleston, S. C.

CLASS 10—25,000 tons semibituminous coal, Indian Head Md.

CLASS 11—2500 tons, bituminous coal, Chelsea, Mass.

CLASS 12—1300 tons bituminous coal, Lake Denmark, N. J.

CLASS 13—1500 tons bituminous coal, Naval Experiment Station, Annapolis, Md.

CLASS 14—12,000 tons bituminous coal, Naval Academy Annapolis, Md.

CLASS 15—2500 tons bituminous coal, Naval Medical School, Washington, D. C.

CLASS 16—30,000 tons bituminous coal, Navy Yard, Washington, D. C.

CLASS 17—15,000 tons semibituminous coal, Norfolk, Va., (a) f.o.b. cars in navy yard, (b) f.o.b. barge at water front,

BIDS ON CLASSES 1, 2, 6 AND 12

Class	1	2								6				12
		a	b	c1	c2	c3	c4	c5	c6	a	b	c	d	
W. Hall Bradford										$2.53	$2.68	$3.13	$3.03	
										14,560	14,560	14,560	14,560	
Com. Coal Co.				$3.39	$3.39	$3.39	$3.39	$3.39						
				14,000	14,000	14,000	14,000	14,000						
Dexter Carpt.[1]		$3.15	$3.55	3.65	4.10	3.60	3.65	4.20	3.70	2.73	2.88	3.33	3.23	
				14,550c	14,550c	14,550c	14,550c	14,550c	14,550c	14,550d	14,550d	14,550d	14,550d	
Empire Coal Mining Co.	$2.97													$3.75
	14,300													14,500
Greensburg Coal & Coke Co.	2.93													3.54
	14,600													14,500
Greensburg C.& C. Co. (alternate)														3.54
														14,500
Geo. D. Harris & Co.	3.05													3.55
	14,450													14,500
Geo. D. Harris & Co. (alternate)														3.50
														14,500
W. P. W. Haff	3.10	3.10	3.50	3.60	4.10	3.60	4.10	4.10	4.10					
	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500	14,500					
Keystone C. & C. Co.		3.27	3.67	3.47	4.07	3.47	4.07	4.07	4.07					
				14,500e	14,500e	14,500e	14,500e	14,500e	14,500e					
A. McNeill & S. Co.		3.14	3.49	3.54	3.99	3.54	3.64	4.14	3.80					
				14,700	14,700	14,700	14,700	14,700	14,700					
Penn. Coal & Coke Corp.										2.68	2.83	3.28	3.18	
										14,700	14,700	14,700	14,700	
Penn. Fuel Co.	3.10	3.10	3.60	3.43	4.00	3.43	3.50	4.00	3.49					
	14,500	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400					
Piedmont & George's Creek Coal Co.	3.20	3.20												
	14,500	14,500												
Quemahoning C. Co.		3.19	3.54	3.62	4.19	3.54	3.67	4.29	3.67	2.57	2.70	3.17	3.07	
				14,500	14,500	14,500	14,500	14,500	14,500	14,300i	14,300i	14,300i	14,300i	
J. H. Weaver & Co.		3.20	3.60	3.70	4.25	3.70	3.80	4.25	4.25					
				14,567	14,567	14,567	14,567	14,567	14,567					
Chas. J. Wittenberg	3.10	3.15	3.50	4.15	3.50	3.65	3.65	4.40	3.65					
	14,150	14,150	14,150	14,150	14,150	14,150	14,150	14,150	14,150					

1 Alternate bid 5c. per ton more.
c Alternate and original are the same. d On alternate bids. e On alternate bid 14,800. i To 14,500.

(c) stored, piled and trimmed in bins at contractor's expense.

CLASS 18—2500 tons semibituminous coal, Naval Hospital, Norfolk, Va.

CLASS 19—13,000 tons bituminous coal, Naval Training Station, Great Lakes, Ill., (a) delivered f.o.b. cars, (b) f.o.b. mines.

CLASS 20—10,000 tons semibituminous coal, Navy Yard, Charleston, S. C.

CLASS 21—1000 tons, naval hospital, Annapolis, Md.

CLASS 22—3000 tons, Navy Yard, Pensacola, Fla.

Address Paymaster General of the Navy Samuel McGown, Washington, D. C.

Miscellaneous Bids—Atwater & Co., Class 8, $2.70 (14,800 B.t.u.). John P. Agnew & Co., Class 15, $3.65; Class 16, $3.05. Chesapeake & Ohio Coal Agency, Class 8, $2.83 (14,800 B.t.u.), on 50,000 tons. Commercial Coal Mining Co., Class 4a, $2.70 (14,600 B.t.u.); Class 4b, $2.85. Baker Whiteley Coal Co., Class 5a, $2.68 (14,500 B.t.u.); 5d, $2.98. Blaine Mining Co., Class 1, $2.96 (14,200 B.t.u.). Crerar Clinch & Co., Class 19b, $1.17 (12,800 B.t.u.). Consumers Coal Co., Class 9 (14,800 B.t.u.) item 1, $3.94; item 2a., $5.10; item 2b, $4.90; Class 20, (14,800 B.t.u.) $3.36; alternate bid on Class 20, $3.36; Consolidated Coal Co., Class 7 (14,533 B.t.u.), $3.30 and $3.20; Class 10 (14,533 B.t.u.), $3.20. Commercial Coal Co., Class 15 (14,450 B.t.u.), $3.75 and $3.80. J. Maury Dove, Inc., Class 15 (14,300 B.t.u.), $3.75; Class 16 (14,900 B.t.u.), $3.05. Enterprise Fuel Co., Class 13 (14,500 B.t.u.), $3.28; Class 14, $2.85; alternate bid on Class 13, $3.25; Class 21, $2.88; alternate bid on Class 21, $2.86. O. W. Guy Co., Class 18 (15,100 B.t.u.), $3.12 and alternate bid the same. Georges Creek Coal Co., Class 13, $3.34; Class 14 (14,500 B.t.u.), $2.94. Greensburg Coal & Coke Co., Class 4a (14,600 B.t.u.), $2.67; Class 4b, $2.82; Glen Brook Coal Co., Class 4a (14,600 B.t.u.), $2.69; Class 4b, $2.85. Hafer & Sons Coal Co., Class 19b (12,000 B.t.u.), $1.23. Peabody Coal Co., Class 19b (12,850 B.t.u.) a and b, $1.18; alternate bids, $1.12. Rutter & Co., Class 19a (12,500 B.t.u.), $2.75; alternate, $2.60;

BIDS ON CLASSES 1 TO 5

Class	1	2		3			4		5		
		a	b	a	b	c	a	b	a	d	e
W. Hall Bradford	$2.94	.....	.....	$2.59	$2.69	.....	$2.63	.....	$2.49	$2.79	$3.20
	14,560	.....	.....	14,560	14,560	.....	14,400	.....	14,560	14,560	14,560
Berwind C. M. Co.	3.40	.....	.....	2.85	3.00	$3.10	3.00	$3.10	.....	.....	.....
	14,700	.....	.....	14,700	14,700	14,700	14,700	14,700	.....	.....	.....
Dexter & Carp., Inc	3.15[1]	$3.15	$3.55	2.75	2.85	2.75	2.88	3.03	2.58	2.88	3.38
	14,550c	14,550c	14,550c	14,550d	14,550d	14,550 l	.....	.....	.....	.....	.....
Dexter & Carp., Inc. (alternate)	.....	.....	.....	.....	.....	.....	2.95	3.10	2.68	2.98	2.48
	.....	.....	.....	.....	.....	.....	14,550c	14,550c	14,550c	14,550c	14,550c
Keystone C. & C. Co.	3.00	3.27	3.67	2.40	2.50	2.75	2.70	2.85	.....	.....	.....
	14,500	14,500e	14,500	14,300	14,300	14,300	14,500	14,500	.....	.....	.....
Logan Coal Co.	2.84	.....	.....	.....	.....	.....	2.66	2.80	2.50	2.80	3.30
	14,560	.....	.....	.....	.....	.....	14,4 0	14,440	13,850	13,850	13,850
A. McNeill & S. Co.	2.98[2]	3.14	3.49	2.64	2.74	2.99	2.70	2.85	.....	.....	.....
	14,500	14,700	14,700	14,700	14,700	14,700	.....	.....	.....	.....	.....
A. McN. ill & S. Co. (alternate)	.....	.....	.....	.....	.....	.....	2.51	2.66	.....	.....	.....
	.....	.....	.....	.....	.....	.....	14,500	14,500	.....	.....	.....
Charles W. Mills	.....	.....	.....	2.85	2.95	3.10	2.85	3.00	.....	.....	.....
	.....	.....	.....	14,700	14,700	14,700	14,400g	14,400g	.....	.....	.....
B. Nicoll & Co.	3.11[3]	.....	.....	2.43	2.53	2.78	2.63	2.78	2.36	2.64	3.14
	14,500h	.....	.....	.....	.....	.....	14,400	14,400	14,400	14,400	14,400
B. Nicoll & Co. (alternate)	.....	.....	.....	2.65	2.75	3.10	.....	.....	.....	.....	.....
	.....	.....	.....	14,500h	14,500h	14,500h	.....	.....	.....	.....	.....
Penn. C. & C. Corp.	3.00	.....	.....	2.75	2.87	3.10	2.95	3.10	.....	.....	.....
	14,600	.....	.....	14,700	14,700	14,700	14,700	14,700	.....	.....	.....
Quemahoning C. Co.	3.05	3.19	3.54	2.65	2.75	3.05	2.73	2.88	2.58	2.87	3.38
	14,200i	14,300i	14,300i	14,300i	14,300i	14,300i	.....	.....	14,300i	14,300i	14,300i
J. Tatnall Lea & Co.	2.90[4]	.....	.....	2.64	2.74	2.89	2.74	2.89	.....	.....	.....
	14,300j	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
J. H. Weaver & Co.	3.00	3.20	3.60	2.75	2.85	.....	2.72	2.87	.....	.....	.....
	14,560	14,567	14,567	14,567	14,567	.....	14,560	14,560	.....	.....	.....
John Wills	2.78[5]	.....	.....	2.83	.....	.....	2.88	3.03	2.69	.....	.....
	.....	.....	.....	14,610	.....	.....	14,610	14,610	14,560	.....	.....
Weston, Dodson Co.	.....	.....	.....	2.74	2.84	2.99	2.74	2.89	.....	.....	.....

[1] Also $2.95 [2] Also $2.79 [3] Also $2.89 [4] Also $3.06 [5] Also $2.86.
c Alternate and original are the same. d On alternate bid. e On alternate bid 14,800. g To 14,690. h Bid "D" 14,400. i To 14,500. j On bid "A"; on bid "B" the B.t.u. was 14,500.

BIDS ON CLASSES 7 TO 10, 12 TO 14, 16 TO 18 AND 20 AND 21

Class	7	8		9	10	12	13	14	16	17		18	20	21
		a	b							a	b			
W. Hall Bradford	.....	.....	$2.58[1]	.....	$3.23	.....	.....	$3.14	.....	.....	.....	.....	.....	.....
	.....	.....	14,560	.....	14,560	.....	.....	14,600	.....	.....	.....	.....	.....	.....
Cast., Cur. & Bullitt	.....	$2.83	.....	.....	.....	.....	.....	.....	.....	$2.80	$2.97	$3.12	.....	.....
	.....	14,850	.....	.....	.....	.....	.....	.....	.....	14,850	14,850	14,850	.....	.....
C. & O. C. & C. Co.	$2.99	2.71	.....	$3.77	.....	.....	.....	.....	$2.99	2.71	2.88	.....	$3.77	.....
	14,900	.....	.....	14,900	.....	.....	.....	.....	14,900	14,900	14,900	.....	14,900	.....
Crozer-Poca. C. Co.	.....	2.60	.....	3.81	.....	.....	.....	.....	.....	2.80	2.97	.....	3.81	.....
	.....	14,800	.....	14,800	.....	.....	.....	.....	.....	14,800	14,800	.....	14,800	.....
Dexter & Carp.	.....	.....	.....	.....	3.27	$3.60	$3.30	3.05[6]	.....	.....	.....	.....	3.40	$2.90[9]
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dexter & Carp. (alternate)	.....	.....	.....	.....	.....	$3.60	$3.30	3.05[6]	.....	.....	.....	.....	.....	2.90[9]
Johns Bros.	.....	.....	.....	3.80	.....	.....	.....	.....	.....	2.80	2.97	3.16	3.80	.....
	.....	.....	.....	14,800	.....	.....	.....	.....	.....	14,800	14,800	14,800	14,800	.....
Keystone C. & C. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Logan Coal Co	.....	.....	.....	.....	.....	3.50	.....	2.80	.....	.....	.....	.....	.....	.....
Logan Coal Co. (alternate)	.....	.....	.....	.....	.....	3.45	.....	2.75	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	14,400	.....	14,400	.....	.....	.....	.....	.....	.....
A. McNeill & S. Co.	.....	2.80	.....	.....	3.30	.....	.....	.....	3.20[8]	.....	.....	.....	.....	.....
	.....	15,000	.....	.....	14,600	.....	.....	.....	14,650	.....	.....	.....	.....	.....
E. P. Murphy & Son, Inc	3.05	.....	.....	3.81	.....	.....	.....	.....	3.05	2.80	.....	.....	3.81	.....
	15,000	.....	.....	15,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
E. P. Murphy & Son, Inc. (alternate)	.....	.....	.....	.....	.....	.....	.....	.....	3.05	2.80	.....	.....	3.81	.....
	.....	.....	.....	.....	.....	.....	.....	.....	15,000	15,000	.....	.....	.....	.....
B. Nicoll & Co.	.....	.....	.....	.....	.....	3.48	3.22	2.80[7]	.....	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	14,400	.....	14,400	.....	.....	.....	.....	.....	2.82
Quemahoning C. Co.	.....	.....	.....	.....	.....	3.60	3.34	2.93	.....	.....	.....	.....	.....	2.98
	.....	.....	.....	.....	.....	14,300	.....	14,300	.....	.....	.....	.....	.....	14,300
Smokeless Fuel Co.	.....	2.85[5]	.....	3.81	3.40	.....	.....	.....	3.05	2.80	2.97	.....	3.52	.....
	.....	.....	.....	15,000	15,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
Smokeless Fuel Co (alternate)	.....	.....	.....	.....	.....	.....	.....	.....	3.05	2.80	2.97	.....	3.52	.....
	.....	.....	.....	.....	.....	.....	.....	.....	15,000	15,000	15,000	.....	14,600	.....
White Oak Coal Co.	3.05	2.83	.....	3.81	.....	.....	.....	.....	3.05	2.80	.....	.....	.....	.....
	15,000	15,000	.....	15,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
White Oak Coal Co. (alternate)	.....	.....	.....	.....	.....	.....	.....	.....	2.90	2.65	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	15,100	15,100	.....	.....	.....	.....
John Wills	2.99	.....	.....	.....	.....	.....	.....	.....	3.08	.....	.....	.....	.....	.....
	14,560	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
John Wills (alternate)	.....	.....	.....	.....	.....	.....	.....	.....	2.99	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	.....	14,610	.....	.....	.....	.....	.....
Weston Dodson Co.	.....	2.83	.....	.....	.....	3.90	3.75	3.15	3.10	.....	.....	.....	.....	.....
Weston Dodson Co (alternate)	.....	.....	.....	.....	.....	3.90	3.75	3.05	3.00	.....	.....	.....	.....	.....
	.....	.....	.....	.....	.....	.....	.....	14,600	14,600	.....	.....	.....	.....	.....
C. G. Blake Co.	3.05	2.89[3]	.....	3.80	.....	.....	.....	.....	3.05	2.80	2.98	.....	3.80	.....
	14,850	14,850	.....	14,850	.....	.....	.....	.....	14,850	14,850	14,850	.....	14,850	.....

[1] 50,000 tons. [3] On 120,000 tons. [4] Also $2.70 and $2.75 for 50,000 tons each. [5] On 100,000 tons. [6] Also $2.90. [7] Also $3.05. [8] Also $3.10. [9] Also $3.05 and $3.15.
Note. Keystone C. & C. Co. bid $2.60 on Class 8 (b) and $2.45 on 200,000 tons. Penn. C. & C. Corp. bid $2.80 on Class 12. J. H. Weaver & Co. bid $2.63 on Class 8 (b). Chesapeake & Ohio C. & C. Co. also bid $4.33 on Class 19 (b).

Class 19b, $1.35, and alternate $1.23. Sterling Coal Co., Class 4a, $2.72; Class 4b, $2.85. Smokeless Fuel Co., Class 8 (14,900 B.t.u.), $2.85 for 100,000 tons. Same company Cincinnati, Class 9 (15,000 B.t.u.), item 1, $3.81. Whitney & Kemmerer, Class 12 (14,300 B.t.u.), $3.55; alternate the same. White Oak Coal Co., Class 9 (15,000 B.t.u.), item 1, $3.81. Willard Bros., Class 1 (14,500 B.t.u.), $3.15. John Wills, Class 1, $2.86; same, Philadelphia, Class 6a, $2.69. Gulf Smokeless Coal Co., Class 8, $2.85 for 200,000 tons. C. G. Blake Co., Class 9, item 1, $3.80. William Johnson & Co., Class 9 (14,850 B.t.u.), Item 1, $3.90; Item 2a, $5.05 Item 2b, $4.85; Class 20, $3.90 with alternate bid of $3.88. Johns Bros., Class 17c (14,800 B.t.u.), $3.04. J. E. Lewis & Co., Class 11 (14,850 B.t.u.), $4.44. F. R. Long & Co., Class 1 (14,700 B.t.u.), $3.21. Lynch & Read, Inc., Class 10 (14,650 B.t.u.), $3.24; Class 16, $2.93; Class 21, $2.89. Martin-Howe Coal Co., Class 19a (13,000 B.t.u.), $2.77; Class 19b, $1.29. Marshall-Matlack & Co., Class 1 (14,400 B.t.u.), $2.98; Class 4a, $2.69. E. P. Murphy & Son, Inc., Class 9 (15,000 B.t.u.), Item 1, $3.81. Metropolitan Coal Co., Class 11 (14,750 B.t.u.), $4.35. New England Coal & Coke Co., Class 17a (14,850 B.t.u.), $2.85. New River Coal Co., Class 8 (14,800 B.t.u.), $2.85 for 60,000 tons. Nottingham & Wrenn Co., Class 17a (14,800 B.t.u.), $2.80; Class 17b, $2.97; Class 18, $3.15; alternate bids, Class 17a, $2.75; alternate bids, Class 17b, $2.92; alternate bids, Class 18, $3.10. O'Gara Coal Co., Class 19a (13,500 B.t.u.), $2.94, alternate, $2.91; Class 19b, $1.29, alternate, $1.26. Peerless Coal Mining Co., Class 14 (14,500 B.t.u.), $2.94. Hite & Rafetto, Class 1 (14,040 B.t.u.), $2.96. Punxsutawney Coal Mining Co., Class 3a (14,200 B.t.u.), $2.50; Class 3b, $2.60.

✚No. 363—Toledo, Ohio—The letting of this contract (p. 566), which provides for furnishing the Water-Works Department with about 15,000 tons of bituminous and anthracite coal, is still being delayed pending the completion of very exhaustive experiments which are being conducted with different fuels. Address Water-Works Board, Valentine Bldg., Toledo, Ohio.

✚No. 508—Philadelphia, Penn.—Bids on this contract (p. 665) will be received until 2 p.m., June 7. No bid of $500 or more will be considered unless accompanied by a certificate to the effect that the provisions of Rule 3 of the Board have been complied with. Address Supt. of Supplies A. F. Hammond, Room 392, City Hall, Philadelphia, Penn.

✚No. 574—Cincinnati, Ohio—Bids on this contract (p. 749) were as follows: DISTRICT NO. 1—Reliance Coal & Coke Co., New River mine-run, $2.93; splint lump, $2.64; splint nut, pea and slack, $2.17. Ulland Coal Co., Pocahontas mine-run, $2.81; splint lump, $2.68; splint nut, pea and slack, $2.20. DISTRICT NO. 2—Ulland Coal Co., Pocahontas mine-run, $2.90; Reliance Coal & Coke Co., Pocahontas mine-run, $2.93; splint lump, $2.73; splint nut, pea and slack, $2.17. DISTRICT NO. 3—Reliance Coal & Coke Co., Pocahontas mine-run, $3.07; splint lump, $3.23. J. M. Mueller, Pocahontas mine-run, $2.94; splint lump, $3.25. J. J. Weis, Pocahontas mine-run, $2.92; splint lump, $3.50. DISTRICT NO. 4—Reliance Coal & Coke Co., Pocahontas mine-run, $2.97; splint lump, $3.17. Hyde Park Supply Co., Pocahontas mine-run, $2.94; splint lump, $3. Address Business Mgr. C. W. Handman, Bd. of Edu., Cincinnati, Ohio.

✚No. 665—Watseka, Ill.—We are advised that the trustees have not yet taken up the matter of letting this contract (p. 836), which provides for furnishing the fuel requirements of the Hospital during the ensuing year. It has not been decided when the matter will come up for consideration. Address Pres. of the Bd. A. F. Goodyear, Iroquois Hospital, Watseka, Ill.

✚No. 673—Buffalo, N. Y.—The call for bids on this contract (p. 836), which provides for furnishing the requirements of the City Poor Department, was responded to by only two bidders, the Buffalo Fuel Co. and C. & A. M. Kaiser. The lowest figure was submitted by the latter, being $5.62 for April delivery, but all the bids submitted were on a sliding scale arrangement. Address Overseer of Poor Louis Kengott, Buffalo, N. Y.

✚No. 679—Dayton, Ohio—Bids on this contract (p. 876), which provides for furnishing about 6000 tons of coal to the local Board of Education, will be received until noon, June 10. Bids are to be submitted covering cost of delivery in the bins at the several schools and also f.o.b. Dayton, Ohio. Address Clk. C. J. Schmidt, Bd. of Edu., Dayton, Ohio.

✚No. 696—Salem, Mass.—The bids on this contract (p. 877), which provides for furnishing the County Commissioners with 2000 tons of steam coal and 100 tons of anthracite, were: John Girdler, Georges Creek, Cumberland, $4.55 to $4.65; G. L. Gage Co., New River Coal, $4.95; Cross Coal Co., New River coal, $4.95; Atkinson Coal Co., New River coal, $4.70 to $4.42; Theberge Bros., New River coal, $5.14; Charlotte Fairfield, anthracite, $6.85; M. O'Mahoney, anthracite, $8.45; E. H. Humphrey, $7. Address Clk. H. E. Thurston, Essex County, Salem, Mass.

✚No. 706—New York—Owing to a legal technicality it has been decided to readvertise for bids on this contract (p. 915). Complete list of bids on the original contract was made up ready for publication, but withdrawn when it was announced that all bids would be rejected. Copies of the original bids will be furnished interested parties on application to "Coal Age." Slight changes in the tonnages required are to be made and it is expected the new bids will be opened at noon on June 8. Specifications will be ready in a few days. Address F. R. Leach, Secy., Central Purchasing Committee, Room 1226, Municipal Bldg., New York City.

✚No. 715—New York—Bids on this contract for Ellis Island (p. 916) were opened May 24 with the following result, quotations being made at both the upper and lower ports:

	Stove 100 Tons		Pea 2400 Tons		No. 1 Bkwht. 1500 Tons	
	Upper	Lower	Upper	Lower	Upper	Lower
Pattison & Bowns...	$6.17	$6.17	$3.79	$3.79	$2.93	$2.73
W. P. W. Haff.....	6.31	6.31	3.84	3.84	3.09	2.77
Clarksburg Coal Mining Co.	7.00	4.50	3.80	3.30	2.80	
Commercial Coal Co.....	5.89	4.09	...	3.34	...	
Weston Dodson & Co.....	5.86	...	4.07	3.01	2.76	
Garfield & Proctor Coal Co.	...	...	3.98	...	...	
George D. Harris & Co....	...	...	...	3.23	2.82	
Charles D. Norton & Co...	...	...	...	...	2.78	

For furnishing 2200 tons of pea coal for the tug "Immigrant," Pattison & Bowns bid $3.69; Clarksburg Coal Mining Co., $3.70; Commercial Coal Co., $3.89, and Burns Bros., $3.89. Address Commissioner of Immigration, Ellis Island, New York Harbor, N. Y.

No. 726—New York—This contract (p. 916), which provides for furnishing coal for fireboats, calls for 5300 gross tons of anthracite egg or stove size, to be delivered at three points, on or before Apr. 1, 1916. Bids are to be opened at 10:30 a.m. June 1. Address Fire Comr. Robert Adamson, Municipal Building, New York City.

New Business

✚No. 756—Cedar Rapids, Iowa—The Iowa Ry. & Light Co. at this place will contract some time next month or in July for approximately 75,000 tons of 1½-in. screenings. Address Iowa Ry. & Light Co., Cedar Rapids, Iowa.

✚No. 757—Bloomfield, Iowa—The City Electric Light & Water Plant at this place will be in the market some time during next month for 2500 tons of coal. The business is done on a competitive basis, and Novinger, Mo., mine-run coal is customarily used. The present coal was bought at $1.67 per ton at the mine; the freight rate is 50c., and the wagon haul 28c. per ton. Address Treas. R. C. Bristow, City Light & Water Plant, Bloomfield, Ia.

✚No. 758—Springfield, Ohio—Bids will be received by the trustees of the local hospital until noon, June 15, for furnishing the coal required during the period ending June 1, 1916. Address Clk. William H. Mahoney, Hospital Bd., Springfield, Ohio.

✚No. 759—Waterbury, Conn.—The Board of Education at this place will be in the market some time during June for approximately 2000 tons of Lehigh stove coal. The business is let on competitive bids among the local dealers. Address Comptroller of City, Waterbury, Conn.

✚No. 760—New Bedford, Mass.—The Board of Education at this place will be in the market some time during next month for 2600 tons of Lehigh egg coal, which is usually bought at about $6.95 per ton. The call for bids is advertised in the local papers, and the business done on an annual contract. Address Committee on Fuel, City Council, William St., New Bedford, Mass.

✚No. 761—Webster City, Iowa—The Electric Light & Water Works Plant at this place will be in the market some time next month for about 4600 tons of mixed steam coal, which is usually purchased at $1.20 per ton. The call for bids is advertised. Address Webster City Electric Light & Water Works Plant, Webster City, Iowa.

✚No. 762—Springfield, Tenn.—The City Water Works & Electric Plant at this place will be in the market some time during next month for approximately 2500 tons of western Kentucky mine-run coal. A very high grade product is required, and the usual price is about $2 per ton f.o.b. Springfield. Address City Water Works & Electric Plant, Springfield, Tenn.

✚No. 763—Americus, Ga.—The Local Water & Light Plant at this place will be in the market some time during the summer for 4000 tons of steam coal, and 1800 tons of gas coal. The business is usually done at about $3 per ton on the steam grade, and $3.70 per ton on the gas coal. Address the City Water & Light Plant, Americus, Ga.

+No. 764—Franklin, Ohio—The contract of the Franklin Board & Paper Co., at this place, expires on July 1, and bids will be received on June 1. Its requirements are about 1000 tons of nut and slack coal per year. Address Secy. Fred. B. Zartman, the Franklin Board & Paper Co., Franklin, Ohio.

+No. 765—Martinsburg, W. Va.—Bids will be received until noon, June 14, for furnishing the local Board of Education with seven carloads of Georges Creek Coal. Quotations should be made f.o.b. Martinsburg. Mine-run coal is required, and bidders should specify the mines from which they propose furnishing the coal. Adress Secy. W. A. Pitzer, Bd. of Edu., Martinsburg, W. Va.

+No. 766—South Bethlehem, Penn.—Sealed bids were received up to May 28 for furnishing 30 tons of pea coal, 20 tons of chestnut and 10 tons of stove, for the Northampton Heights schools. Address Secy. George E. Borman, Bd. of Edu., South Bethlehem, Penn.

+No. 767—Welland, Ont., Can.—Bids will be received until noon, June 2, for furnishing the county buildings with about 200 tons of anthracite coal. Address County Clk. Robert Cooper, Welland, Ont., Can.

+No. 768—Washington, D. C.—Sealed proposals will be received until noon, June 16, for furnishing the Government 4000 short tons of bituminous coal. Variations of 20% greater or less than this amount may be required at the option of the Government. Address Col. H. C. Newcomer, Corps of Engrs., Room 305, Southern Bldg., Washington, D. C.

+No. 769—Towson, Md.—Sealed proposals were received until 11 a.m., May 26, for furnishing Baltimore County with coal as follows: 35 tons of white ash, 10 tons of nut, 80 tons No. 1 white ash, 40 tons No. 3 white ash, 160 tons No. 1 white ash. Deliveries are to be made in some instances, and in others quotations should be f.o.b. railroad switch. Bidders should specify exactly what coal they propose furnishing. Address Chief Clk. C. W. J. Fox, County Comrs., Towson, Md.

+No. 770—Peterboro, Ont., Can.—Sealed proposals were received until noon, May 26, for furnishing 600 tons of either select three-quarter Youghiogheny lump or smokeless coal, to be delivered to the local schools as required. Address Secy.-Treas. G. H. Thompson, Bd. of Edu., Peterboro, Ont., Can.

+No. 771—Waynesboro, Penn.—Bids were received until 6 p.m., May 27, for furnishing the schools of Washington Township with coal during the coming school year. Address Henry Hess, Bd. of Edu., Waynesboro, Penn.

+No. 772—Boston, Mass.—Sealed proposals will be received by the Metropolitan Water and Sewerage Board until 1:30 p.m., June 2, for furnishing coal as follows, in gross tons: For Water-Works at Chestnut Hill Pumping Station, 5000 tons; at Arlington Pumping Station, 450 tons; at Hyde Park Pumping Station, 150 tons; at Spot Pond Pumping Station, 800 tons; at Natick Station of Boston & Albany R.R., 80 tons; sewerage works at Deer Island Pumping Station, 2700 tons; at East Boston Pumping Station, 3000 tons; at Charlestown Pumping Station, 1200 tons; at Alewife Brook Pumping Station, 425 tons; at Ward Street Pumping Station, 2300 tons; at Quincy Pumping Station, 450 tons; at Nut Island Screen House, 550 tons. Specifications and complete information may be had on application. Address Secy. William N. Davenport, Metropolitan Water and Sewerage Bd., 1 Ashburton Place, Boston, Mass.

+No. 773—Denver, Colo.—Bids will be received by the Board of Education at this place for furnishing fuel to the local schools during the fiscal year beginning June 1, until noon of that day. Address Secy. W. A. E. Stutt, Bd. of Edu., 19th and Stout St., Denver, Colo.

+No. 774—Washington, D. C.—Sealed proposals will be received by the Department of the Interior until 2 p.m., June 22, for furnishing the Indian Service with approximately 106 tons of blacksmith coal, 38,763 tons of bituminous coal and 4947 tons of anthracite; the contract is to run during the fiscal year beginning June 30. Schedules giving all the necessary information may be had on application and bids should be submitted on government blanks. Address Indian Office at Washington, D. C., or United States Indian Warehouses at Chicago, St. Louis and San Francisco.

+No. 775—North Yakima, Wash.—The Board of Education will receive bids until 7 p.m., June 3, for furnishing and delivering approximately 800 tons of coal to the various school buildings in the district. All bids must be accompanied by a certified check for 5% of the bid, and complete descriptions of the coal must be included. Address Secy. B. F. Kumler, North Yakima, Wash.

+No. 776—Ridgefield Park, N. J.—Sealed bids will be received until 8:30 p.m., June 11, for furnishing approximately 300 tons of coal to the local schools during the ensuing year. White ash, pea, stove, nut and egg coal are required, and deliveries are to be made as directed. Address District Clk. G. H. Noethling, Bd. of Edu., Overpeck Township, Ridgefield Park, N. J.

+No. 777—Washington, D. C.—Sealed proposals will be received until 2 p.m., June 1, for furnishing approximately 25,000 tons of bituminous coal to the U. S. Capitol Power Plant during the fiscal year ending June 30, 1916. Bids should be made on the long-ton basis and all bidders must specify the name of the coal and location of their mines. Quotations should be made on sidings at the Capitol Power Plant, situated in Garfield Park. All proposals must be accompanied by a certified chick for $100. Address Elliott Woods, U. S. Capitol Bldg., Washington, D. C.

+No. 778—Lapeer, Mich.—Sealed bids will be received by the Michigan Home and Training School until 10 a.m., June 10, for furnishing the Institution with approximately 7000 tons of bituminous, nut, pea, and slack and 100 tons of No. 1 chestnut (anthracite) coal. Bids must be submitted on blank forms which may be obtained on application. Address Steward H. S. Evans, Michigan Home and Training School, Lapeer, Mich.

+No. 779—Onawa, Iowa—Bids will be received until June 7 for furnishing the local Electric Light Plant with coal during the fiscal period beginning June 1 of the current year and ending Mar. 31, 1916. Address City Clk. C. L. Collins, Onawa, Iowa.

+No. 780—Boston, Mass.—Sealed proposals were received until noon, May 27, for furnishing the Suffolk County Jail with 650 tons of furnace coal, 100 tons of screening and 300 tons of Pocahontas or New River semibituminous. The price should include cost of delivery and be made on the gross ton basis. All proposals must be accompanied by a certified check for $300 and a bond for one-quarter the amount of the contract must be furnished by a satisfactory surety company. Address Sheriff John Quinn, Jr., Court House, Pemberton Square, Boston, Mass.

+No. 781—Seattle, Wash.—Sealed proposals will be received by the United States Army until 11 a.m., June 2, for furnishing 158,500 lb. of the best quality Cumberland (or equal) smithing coal sacked for delivery to various army posts in Alaska, Washington, Wyoming, and on the Puget Sound. Deliveries are to be made during the fiscal year commencing July 1. Bids should be made on the basis of 100 lb. including cost of sacks, and the Government reserves the right to vary its requirements, as stated, 20%. Blank forms and specifications may be had on application. Address Col. George B. Davis, Depot Quartermaster's Office, U. S. Army, 3122 Arcade Bldg., Seattle, Wash.

Contracts Awarded

Note—Successful bidders are noted in **bold face type.**

+No. 461—Boston, Mass.—This contract (pp. 627, 748, 794), which provides for furnishing and delivering 41,300 tons of coal to the various city departments has been awarded as follows: **Metropolitan Coal Co.,** Children's Institute (800 tons) $4.09; Ferry Service (11,000 tons) $3.74; Calf Pasture Sewer Division (8000 tons) $3.75. **Darrow-Mann Co.,** Penal Institute, (6500 tons) $3.70. **Gorman-Leonard Coal Co.,** Infirmary Department (6000 tons) $3.84; City Hospital, (9000 tons) $3.76. Address Supt. of Supplies D. Frank Doherty, Room 808, City Hall Annex, Boston, Mass.

+No. 607—New Orleans, La.—This contract (p. 795), which provides for furnishing the U. S. Coast Guard with 2500 tons of bituminous coal, has been awarded to the **New Orleans Coal Co.** Address Special Deputy Collector Calhoun Fluker, Custom House, New Orleans, La.

+No. 609—Munhall, Penn.—This contract (p. 795), which provides for furnishing the Local Board of Education with lump and slack coal has been awarded to **Harvey Hall & Co.** Address Secy. Bd. of Directors John Bell, Jr., 1302 Louise St., Munhall, Penn.

+No. 647—Worcester, Mass.—This contract (pp. 835, 918), which provides for furnishing the County Commissioners with coal, has been awarded, in part, to **F. E. Powers Co.,** for furnishing 300 tons of anthracite to the Court House at $6.92½ per ton and $6.67 per ton for 30 tons required at Oakdale for the training school. Announcement of the remaining awards has not been received. Address County Commissioners, Court House, Worcester, Mass.

+No. 668—New York, N. Y.—This contract (p. 836), which provides for furnishing white ash anthracite and Cumberland coal, has been awarded to **J. S. Conabeer,** for $8558.25. Other bidders on this contract were: O. J. Stephens, $8695.70, and Burns Bros., $9120. Address Pres. Douglass Matthewson, Crotona Park, 177th St. and Third Ave., New York City.

✚**No. 669—Sleepy Eye, Minn.**—This contract (p. 669), which involves approximately 1000 tons of steam coal for the Electric Light Plant, has been awarded to **R. H. Bingham & Sons** on Youghiogheny 2-in. screenings at $4.20 per ton f.o.b. Sleepy Eye. Address City Recorder H. Peterson, City Council, Sleepy Eye, Minn.

✚**No. 674—New York**—The lowest bids on this contract (pp. 795, 876), which provides for furnishing the fuel requirements of the local Board of Education, were as follows: MANHATTAN BOROUGH—Entire Borough, Burns Bros., $152,308.90. The total of lowest bids by items is $716.40 less than the lowest borough bid, as follows: Broken coal, Burns Bros., $106,930; egg coal, George D. Harris & Co., $187.50; stove coal, Harris & Co., $1875; pea coal, Burns Bros., $11,475; No. 1 buckwheat, Harris & Co., $26,625, and semibituminous, Harris & Co., $4500. BOROUGH OF BRONX—Burns Bros. are the lowest at $55,-784.25, or $1255.75 less than the next lowest bid. For supplying 3000 tons No. 1 buckwheat, M. L. Bird bid $140 less than Burns Bros., and on 4800 tons of No. 1 buckwheat he bid $60 less than Burns Bros. BROOKLYN BOROUGH—Bacon Coal Co. bid $143,524.80. The lowest bids by districts were: No. 1, A. J. & J. J. McCollum, $39,245.40; No. 2, J. F. Schmadeke, $51,455; No. 3, McCollum, $32,793.30, and No. 4, Schmadeke, $22,815; a total of $146,408.70. BOROUGH OF QUEENS—Entire borough, Bacon Coal Co., $83,577. Lowest bidders by districts were: No. 1, Burns Bros., $29,408.90; No. 2, S. Tuttle's Son & Co., $28,780.50, and No. 3, Tuttle's Son & Co., $25,295.50. BOROUGH OF RICHMOND—Richmond Ice Co. was the only bidder, at $20,140.25. Address Supt. of School Supplies Patrick Jones, Park Ave. and 59th St., New York City.

LATER—Awards have been made as follows: MANHATTAN, **Burns Bros.**, $152,308.90; BRONX, **Burns Bros.**, $55,784.25; BROOKLYN, **Bacon Coal Co.**, $143,524.80; QUEENS, excepting 3000 tons of semibituminous coal, **Bacon Coal Co.**, $72,057; **George D. Harris & Co.**, 3000 tons semibituminous coal, $11,520. The bid of Richmond Ice Co. of $20,140.25 for Borough of Richmond was laid over for further consideration. Address Supt. of School Supplies Patrick Jones, Park Ave. and 59th St., New York City.

✚**No. 698—Toronto, Ont., Can.**—This contract (p. 877), which provides for furnishing about 500 tons of semibituminous coal, has been awarded to local agencies. Address Secretary, Public Library, College St., Toronto, Ont., Can.

✚**No. 703—Lowell, Mass.**—This contract (p. 877), which provides for furnishing the Lowell Jail and the Training School of North Chelmsford with coal, has been awarded as follows: **Fred Horne,** 150 tons of bituminous at $4.94, 20 tons of anthracite furnace at $6.70; **John P. Quinn,** 500 tons of bituminous at $4.94, 20 tons of anthracite furnace at $7, 30 tons of stove at $7.30. Fred Horne's contract covers the Lowell Jail and the John P. Quinn contract provides for the requirements of the Training School. Address County Commissioners, Middlesex County Court House, Lowell, Mass.

No. 708—North Adams, Mass.—The contract (p. 878), which provides for furnishing coal to the several public buildings at this place has been awarded to **W. J. Nichols** on the following basis: Egg and stove $6.15 per ton; chestnut, $6.40; bituminous, $4.15. This was the lowest of the four bids submitted. Address Com. of Pub. Wks. John Martin, North Adams, Mass.

✚**No. 712—Boston, Mass.**—This contract (p. 878), which provides for furnishing the local Immigration Station with 250 tons of anthracite egg coal, has been awarded to the **Burton Furber Coal Co.** at $6.87 per gross ton. Other bids on this contract were: Wellington Wilde Co., $6.90; Metropolitan Coal Co., $6.97; Chelsea Iron & Coal Co., $7.75. Deliveries are to be made as ordered. Address Commissioner of Immigration, Long Wharf, Boston, Mass.

No. 737—Charleroi, Penn.—This contract (p. 917), which provides for furnishing the local school board with coal during the ensuing year, had been awarded to **T. J. Crombie** at $5.73 per ton of mine-run. Other bidders on this contract were John Redd, $6.25; Charles Reid, $5.74. Address Secy. T. M. Faddis, Bd. of School Directors, Charleroi, Penn.

Contract Notes

Buffalo, N. Y.—The city Fire Department received only one bid for supplying its anthracite requirements, this being from C. A. & M. Kaiser, $5.40 per ton for stove and egg sizes and $5.65 for chestnut, covering April, 1915, with the usual 10c. sliding scale. For bituminous the lowest bidder was the Rochester & Pittsburgh Coal & Iron Co., $4 per ton for selected, hand-picked lump; $2.90 for lump screened and delivered to the fire boats.

Washington, D. C.—Telegraphic bids were requested by the Navy Department for either the transportation of coal, or the coal and transportation, for delivery at the Naval Coaling Depot, Key West, Fla. Coal must be of the Navy standard, and bidders were requested to state the name of the mines from which the coal originates, name of the company, etc. The tonnage involved aggregates approximately 5000 tons and delivery is to be made between June 1 and 15. A daily discharge rate of 350 tons is guaranteed at Key West. Telegraphic bids were also requested until noon May 5 for the transportation of one cargo of coal (5000 to 7000 tons) from the Atlantic Range ports to the Naval Coaling Depot, San Diego, Calif., or Tiburon, Calif. A daily discharge rate of 400 tons is guaranteed. Address Paymaster Gen. Navy., Samuel McGowan, Navy Department, Washington, D. C.

Buffalo, N. Y.—Pickands, Mather & Co. has announced the following prices for Lake steamboat fuel for the season of navigation, delivered to bunkers: $2.80 for three-quarter, $2.70 for mine-run and $2.50 for slack. This is 10c. less than for last season. The three-quarter size is in most use.

Mechanicsville, N. Y.—The contract for the annual supply of coal for the Board of Education at this place has been awarded to **W. G. Morton,** of Albany at $4.10 for pea coal, and $5.45 for egg coal. The contract calls for 350 gross tons of pea, and 150 tons of egg.

New Haven, Conn.—The contract for furnishing 544 tons of coal to the Public Works Department at this place has been awarded to **A. H. Powell Co.,** the total consideration being $2,265.60.

Washington, D. C.—The Navy Department received telegraphic bids until May 15 for transportation of one cargo of coal of from 5000 to 7000 tons from the Atlantic range ports to the Naval Coaling Depot, San Diego, Calif.

Baltimore, Md.—Baltimore City has awarded the contract for supplying coal to the city water-pumping stations to the **Cumberland Coal Co.,** at from $2.90 to $2.92, according to location. The Bay View Hospital contract was given to the same company at $2.90, and the Cumberland company will also supply the schools of the six city districts at prices ranging from $3.35 to $3.45. The contracts cover about 40,000 tons. The George's Creek Coal Co. will supply the ice boats and harbor tug at $2.95, and the Enterprise Fuel Co. the Health Department tug at $2.92 a ton.

✚**Buffalo, N. Y.**—As a result of irregularity in bids, the award of the contract for the County Institutions which was to have been made on May 21 has been postponed for a week, and it is expected that one or more of the bids will be thrown out.

✚**Trenton, N. J.**—The local School Board has awarded the contract for 450 tons of coal for delivery at the schools in Hamilton Township, to the Tattersall Co. and Anderson Bros., on the basis of $5.81 for Highland coal and $5.25 for Jeddo.

Albany, N. Y.—Bids for furnishing the City Hall, Fire Department, Pumping Station and Filtration Plant with 600 tons of coal were as follows: Frank Dessault, $4233.75; F. B. Peck Coal Co., $3878.45; M. V. Van Santvoord, $4035.35; F. B. Marsolais, $4224.25; M. S. Younglove Coal Co., $3956.90.

Export Trade—Press reports are to the effect that the Consolidation Coal Co. will supply 150,000 tons of coal to Italy and the Berwind-White Co. 50,000 tons.

New York—The Vernon Metal & Produce Co., 90 West St., announces the appointment of Hugh L. Kirby as manager of their coal department. They specialize on New River smokeless coal.

Brazil—The Central Ry. of Brazil, a Government line, has recently approached an American concern here with a proposition to purchase 20,000 tons of American Pocahontas coal. The price is said to be $15.09 per ton. The Central Ry. has had special permission from the Government to make its purchases of coal for cash, and to meet payments therefor out of its actual cash receipts, month by month. The director of the road states that it consumes 300,000 tons of coal per year.

New York—Bids were opened May 6 in the office of the United States Coast Guard Service for supplying bituminous coal for the revenue cutters in this harbor, with the following result: George D. Harris & Co., $3.10 per ton in bunkers at dock; $3.69 in bunkers in stream. C. J. Wittenberg, $2.98 and $3.86 respectively; Commercial Coal Co., $3.48 and $3.56 respectively; Penn Fuel Co., $2.90 and $3.75 respectively. Deliveries are to begin July 1.

Argentina—Two offers for the supply of 25,000 tons of steam coal were presented to the Argentine Minister of Public Works at the end of last week—one from a British firm and the other from a North American. The latter offer is understood to have been the more favorable one.

Classified Ads

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Coal Proposals Wanted

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Lapeer, Mich.

Sealed Proposals will be received by the Board of Control of the Michigan Home and Training School (a State institution), Lapeer, Michigan, until ten o'clock A.M. Thursday, June tenth, 1915, for furnishing the institution full requirement of nut, pea and slack (bituminous) coal for the year beginning July 1st, 1915. Approximate requirement 7000 tons.

Sealed proposals will be received at same time for 100 tons No. 1 Chestnut (anthracite) coal.

Proposals must be made on blanks furnished by the institution.

For blanks address H. S. EVANS, Steward, Lapeer, Michigan.

PROPOSALS FOR COAL—Department of the Interior, Office of Indian Affairs, Washington, D. C, May 20, 1915.—Sealed proposals, plainly marked on the outside of the sealed envelope: "Proposal for coal," and addressed to the "Commissioner of Indian Affairs, Washington, D. C.," will be received until 2 o'clock p.m. Tuesday, June 22, 1915, and then opened, for furnishing the Indian Service with, approximately, 106 tons blacksmith coal, 38,763 tons soft coal, and 4947 tons hard coal during the fiscal year ending June 30, 1916. Bids should be made out on Government blanks. Schedules giving all necessary information for bidders will be furnished upon application to the Indian Office, Washington, D. C., and the U. S. Indian Warehouses at Chicago, St. Louis, and San Francisco. The department reserves the right to reject any and all bids, or any part of any bid. CATO SELLS, Commissioner.

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